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FLYING

TECHNOLOGY DEPARTMENT

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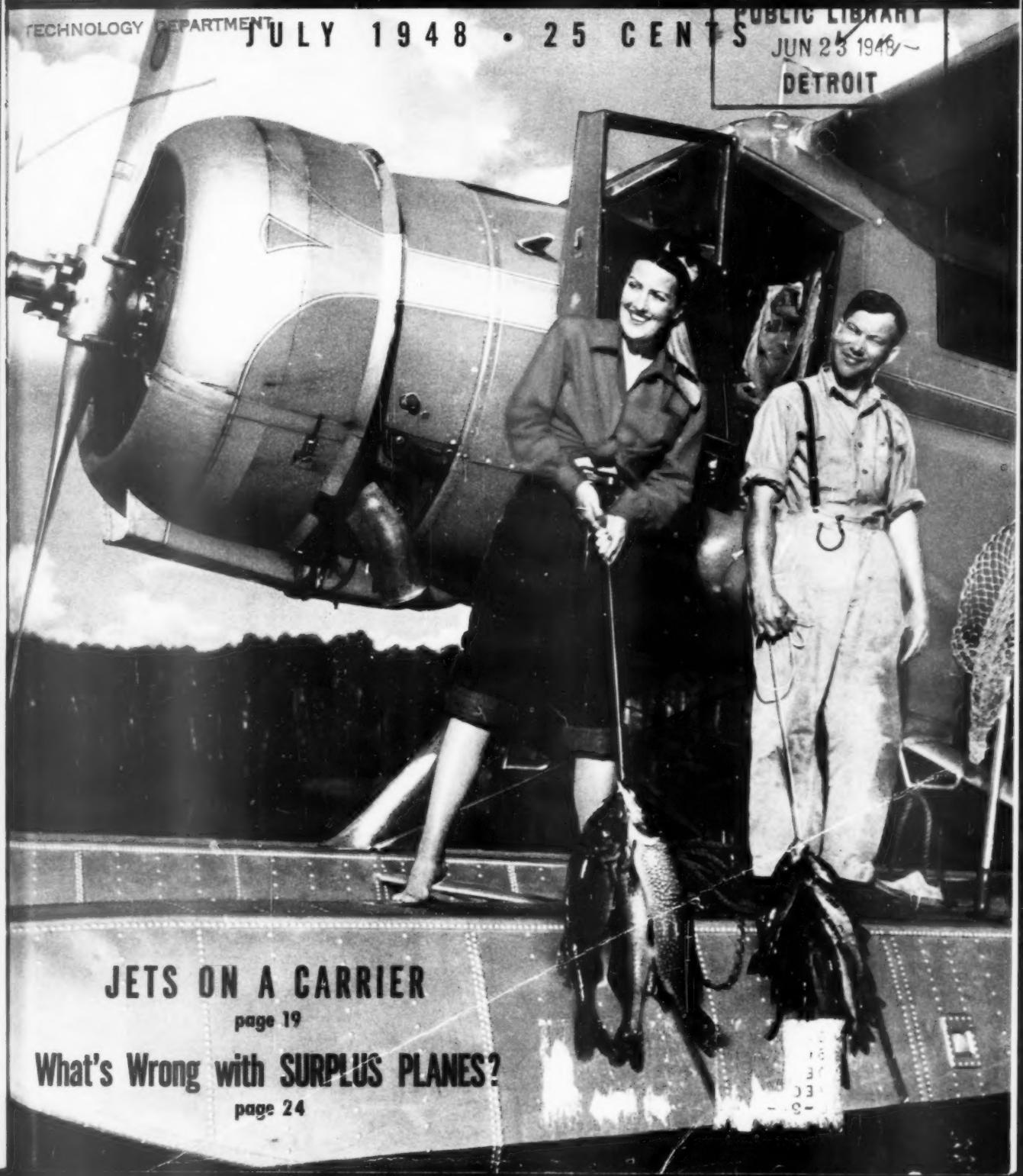

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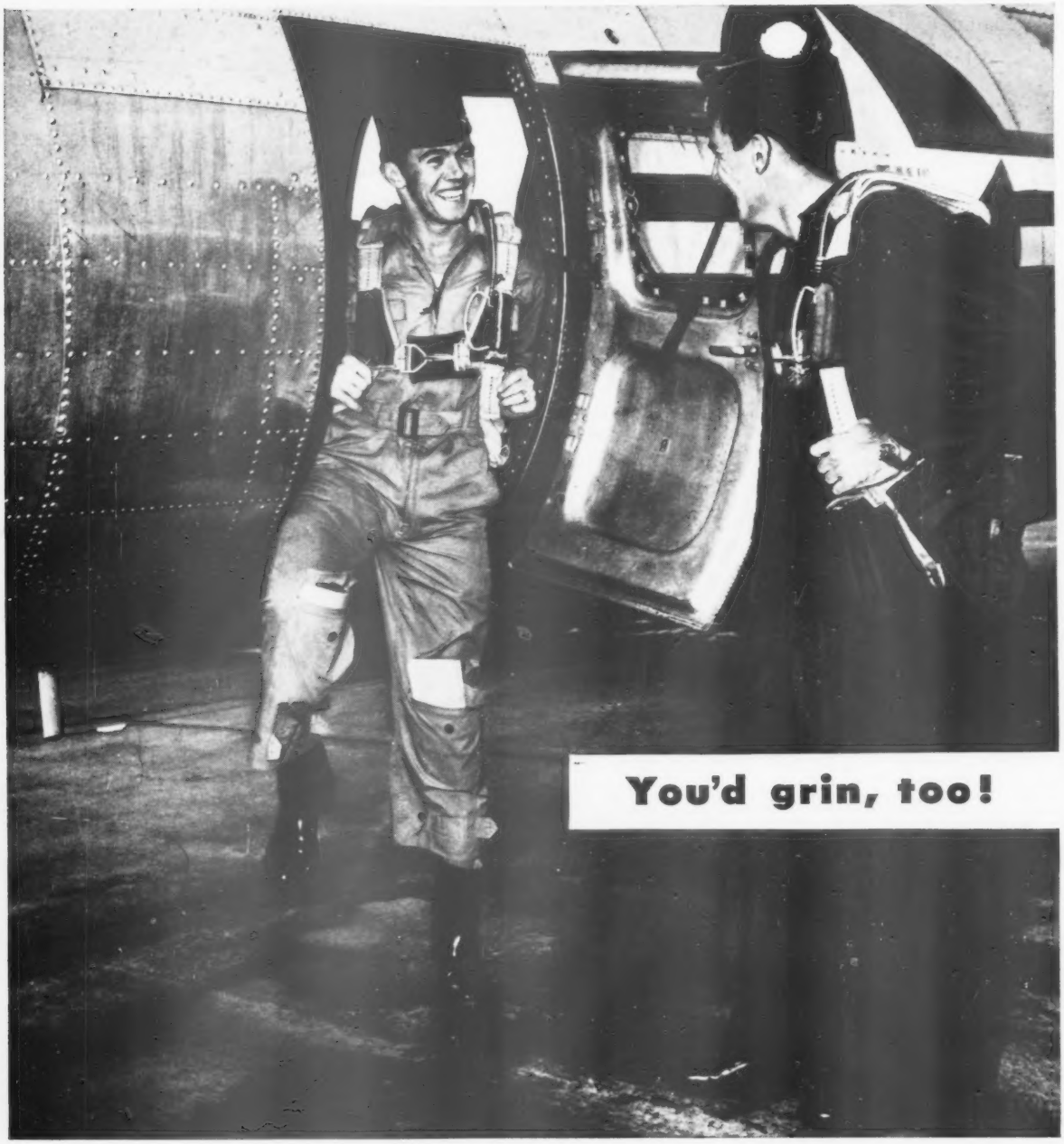

You'd grin, too!

He took her up, cruised high and far, brought her gliding home to a smooth, easy landing. Now, as he climbs out, his face tells the story. It's one of the great thrills in aviation—commanding a mighty U. S. Air Force bomber in flight.

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Tests of this Pressure-Sealing Zipper door, which B. F. Goodrich developed for a new airplane, showed excellent operation at most temperatures. But when it got down to–70°, the rubber lips that do the sealing job tended to stiffen. And that made the zipper hard to open.

B. F. Goodrich engineers went to work on the problem. They borrowed an idea from another B. F. Goodrich development—electric rubber. By running resistance wires through the core of the rubber lips, enough heat was provided to keep them flexible in extreme cold. Now, temperatures of 70° below—and even lower—hold no threat for the door-sealing lips.

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Pressure-Sealing Zippers have also proved a successful seal for removable sections of air ducts, for inverter covers, for water-tight protective coverings, and control surface seals. They save space by eliminating the need for bolted parts with gaskets. They operate quickly and easily. They are adaptable to any kind of covering, irregular shapes, and light or heavy requirements.

The work which developed the Pressure-Sealing Zipper, electric rubber, and now heated Zippers, is typical of the B. F. Goodrich research which provides aviation with effective answers to tough problems. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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FLYING

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ZIFF-DAVIS PUBLISHING COMPANY
185 North Wabash Ave., Chicago 1, Ill.
Member of the Audit Bureau of Circulations
VOLUME 43 • NUMBER 1

FLYING is published monthly by Ziff-Davis Publishing Company at 185 N. Wabash Ave., Chicago 1, Ill. SUBSCRIPTION RATES: In U. S., Canada, Mexico, South and Central America and U. S. Possessions, $3.00 for twelve issues; in British Empire, $4.00; all other foreign countries, $4.00 for twelve issues. Subscribers should allow two weeks for the change of address. Address all subscription letters to the Director of Circulation, FLYING, 185 North Wabash Avenue, Chicago 1. Entered as second class matter, September 8, 1942, at the Post Office, Chicago, Illinois, under the act of March 3, 1879. Entered as second class matter at the Post Office Department, Ottawa, Canada. Contributors should retain copy of contributions. All submitted material must contain return postage. Contributions will be handled with reasonable care, but this magazine assumes no responsibility for their safety. Accepted material is subject to whatever adaptations and revisions are necessary to meet requirements. Payment covers all authors', contributors' and contestants' rights, title and interest in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

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The Aviation Dept.. Phillips Petroleum Company, Bartlesville, Okla.

Fulcher Armstrong has been interested in aviation for years, building and flying his own plane at an early age. Now an experienced pilot with thousands of flying hours to his credit, Mr. Armstrong is the owner of the thriving Wichita Falls Air Transport Company which operates the municipal airport.

Phillips 66

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—says:

OMAR MIDYETT
President

MIDWEST FLYERS
East St. Louis, Ill.

Last year Midwest Flyers equipped their fleet of 29 planes with Safe Flight stall warning indicators. Now Omar Midyett, Midwest President reports;

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DISTANT ANCESTOR

In ["The Superfort Family," April FLYING] I think you forgot to mention projects between the old XB-15 and the B-29. . . .

JOHN BRITTON-MEYER
Soro Academy,
Soro, Denmark

● Distant ancestor of the B-29 and B-50, the Boeing XB-15 was purposely omitted from FLYING's story, which discussed only the evolvement of the *Superfort* from the 29 series to the 50 series. The XB-15 (lower photo) looked more like the *Flying Fortress*,

but its top speed was only 197 compared with the *Fortresses'* over 300 m.p.h. The XB-15, however, had a span of 149 feet while the B-17's span was 103 ft., 9 in.—ED.

LET'S NAVIGATE

"Navigate by the Rule of 60" [by Comdr. D. S. Quilter, April FLYING] was fine advice both for experienced navigators and student pilots. . . .

But shame on the Commander for leaving out the famous old adage of all navigators: "Can Dead Men Vote Twice." By learning the above five words, one can never go wrong—such as forgetting deviation, variation or wind correction. The first letter of each word is the key to an operation—C for compass, D for deviation, M for magnetic, V for variation, and T for true course.

This process having been performed, one has only to figure wind correction—and he's free to fly "by the rule of 60."

WILLIAM FRANCIS SCHRETZMAN
Brooklyn, N. Y.

. . . I'd like to reproduce this article for my Ground School classes and for general distribution to the flying public.

KENNETH J. QUINLIN
Allied Aviation Corporation
Williamantic, Conn.

. . . The most sensible approach to this subject I have ever read.

DAVID M. GILTINAN
Charleston, W. Va.

. . . I admire a man who knows his subject and shares it with others. "Navigate by the Rule of 60" and others in FLYING in the past, I cut out and file for reference.

T. L. BYRNE
Burbank, Calif.

COMPLICATED SUBJECT

Colonel Tibbets ["Why Pilots Make Mistakes," April FLYING] says that cockpits and controls of large aircraft are too complicated and are a major cause of crashes. . . .

Pilot error *is* a major cause, but because pilots don't know their aircraft—not because cockpits or panels are complicated.

CAPT. R. W. EGGERT
Fairfield-Suisun Air Force Base
California.

. . . I doff my hat to Paul W. Tibbets, Jr. . . .

Complicated cockpits are bad, as he points out, and I agree, of course, although I am tempted to add (not speaking as an expert at all) that a very bad combination indeed is complicated cockpits and simple pilots.

HIRAM WILSON SHERIDAN
Oak Park, Ill.

NEW SIGNPOST

The CAA appreciates your good story on the segmented circle marker system (Airport Signposts, April FLYING) but in your picture on page 20 the northwest-southeast runway markers are inaccurate. Those at the bottom should point the same way as

those at the other end of the runway. Otherwise, the taking-off traffic would be led around the field to the right and would come in over the high hill. They should turn left after take-off and thus follow the arrow at the top of that runway for the direction of their approach.

BEN STERN
Assistant Administrator
Aviation Information
Civil Aeronautics Administration
Washington, D. C.

● For corrected signpost, see photo.—ED.

AIRPORT HONEYMOON

I spent my honeymoon traveling piggyback in a P-38 with an "air-happy" husband. I was feeling unspeakably sorry for myself until I read Janice Futch's article

(Continued on page 83)

The great new '48 Stinson. Cruising Speed: 130 m.p.h. Non-stop flying range, at 5,000 feet: 554 miles.

Why more and more men *OVER 40* are flying Stinsons for business and pleasure!

SCARCELY a day passes without our getting a letter from a business or professional man that reads like this:

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2. "My flying salesmen keep both planes busy all the time," he adds. "Our customers appreciate the faster service we're giving."

3. "Our company officials often use one of the planes to visit our other four refineries. Our Stinsons certainly pay for themselves."

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JOTTINGS

. . . **Stall warning indicators** have been installed on more than 4,000 different airplanes, from light trainers and airliners to jet fighters in the past two years. There is no record of any plane so equipped being in a stall or spin accident. Ordinarily one out of every 170 planes each year is involved in a stall-spin accident.

. . . **An intensive survey** by *Esquire* Magazine in Pennsylvania recently asked 1,000 pilots: "What magazines do you read regularly?" Of the 460 who answered, FLYING took top place, with 64.7 per cent.

. . . **A single-seat amphibian,** the TE-1, is being built by the Finnish State Aircraft Factory. Designed by T. Eklund, it is powered with a 28-h.p. Poinsard two-cylinder opposed aircooled engine. Span is only 24 ft. 7 in., empty weight 365 pounds. If successful, it will serve as a prototype for an enlarged four-place version of similar design.

. . . **Terrain proximity indicators,** which were ordered onto all scheduled airliners a few months ago, need no longer be installed. The CAB has rescinded its order because experience showed that the indicators required an unusual amount of maintenance, were subject to error, and had a high rate of malfunctions.

. . . **U. S. bombers** can fly farther than generally believed. The Air Force recently revealed that the Boeing B-50 has a range of 6,000 miles with a 10,000-pound bomb load. Thus it has an operating radius of 2,250 miles. The Republic XF-12, a four-engined reconnaissance plane, has a range of 8,000 miles. It is 50 m.p.h. faster than the B-50 and might be convertible into a bomber.

. . . **A de Havilland D.H.-108** jet plane, flown by John Derry, recently set a new international closed circuit speed record. The swept-wing test plane flew 605.230 m.p.h. around the 100-kilometer course. (See photo below.)

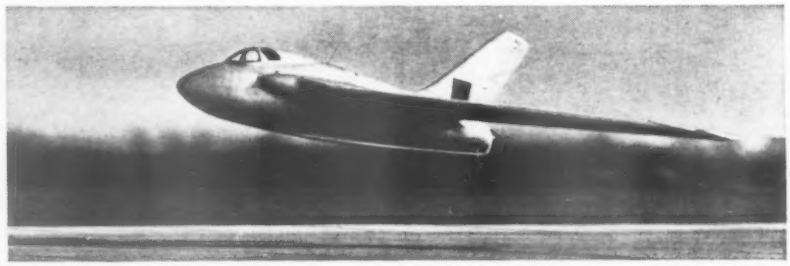
. . . **Eight feeder air lines** last year carried 235,584 revenue passengers a total of 46,409,000 passenger miles. Passenger load factors were less than a third of capacity, however—only 29.9 per cent.

. . . **What happens to superannuated airline pilots?** Of the first 500 members to join the Air Line Pilots Association 17 years ago, only 147 are on active status. Twenty-nine per cent of ALPA's charter members are still actively engaged in airline piloting: 36 per cent are no longer actively flying; 22 per cent hold executive positions with airline companies.

. . . **Flight engineers** will be required on Boeing *Stratocruisers* and Douglas DC-6s after December 1. In addition, the CAA administrator has the right to require flight engineers on planes of over 30,000 pounds take-off weight—such as the DC-4. *Constellations* already have provision for flight engineers.

. . . **Are some pilots accident-prone?** A study by Daniel Horn of the Air Force Flying Safety Division indicates that those who have had one accident are much more likely to have a second very soon. Of 9,348 Air Force pilots who had two or more accidents during a four-year period, more than 15 per cent had a second accident within 30 days of the first. This is over five times the normal expectancy. The pilots' tendency to have a second accident decreases steadily month by month.

. . . **An Arctic chain** of long-range navigation stations is reported nearing completion across the northern frontier of Alaska and Canada. Progress is also "reported" on development of an air-raid warning system across the northern wastes.



De Havilland DH-108 set new international closed course record with 605.230 m.p.h.

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- Metal Top Canopy
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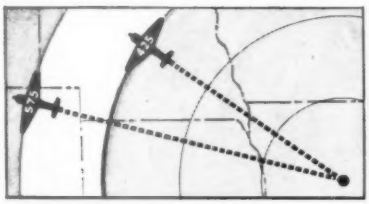
- Aeromatic® Propeller (Deluxe Models)
- Two-Way GE Radio (Deluxe Models)

NEW FEATURES FOR '48 IN THE SWIFT 125



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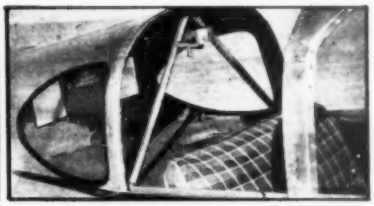

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Alexander sized up the job . . . and wept

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• • • •

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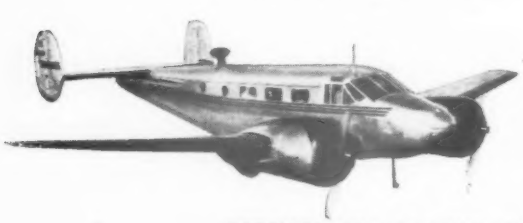

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American Security is Aviation's Top Priority

By Rep. CARL HINSHAW, *Vice-Chairman, Congressional Aviation Policy Board*

A rounded air policy for the United States must include all components of air power, but each must be assigned priority in the order of present value to the whole pattern of the strength we must develop.

We are faced with two perilous situations—the aggressions and tremendous military potential of Russia, and our own failure to maintain a supreme Air Force. We are trying to prevent aggressive Soviet encroachment upon the democratic world through such measures as the European Recovery Program and military aid to Greece and Turkey. The results of the Italian election were a victory; and there are other signs that the peoples of Western Europe are stiffening in their resistance to Communism. But we dare not depend on such measures alone. This country desires peace but it will not accept slavery. Our one real road to security lies in rebuilding our strength, and the foremost weapon of that strength is full development of our air arm.

In the report of the Congressional Aviation Policy Board, we stated: "It is [our] judgment that the capability of the United States most likely to discourage an aggressor against attack upon this Nation, most effective in thwarting such an attack if launched, and most able to deal out retaliation to paralyze further attack is airpower.

"National airpower is an entity not fundamentally divisible as a weapon, or as a carrier. Materials, organization and craftsmanship which go to make a great aviation industry are as readily turned to the combat plane as to the transport. Airway facilities which give scheduled dependability to civil air lines also give tactical dependability to military air forces. Airports which serve the burden of national and international traffic can also base tactical or strategic combat squadrons. Transport fleets which serve commerce in peace can tie together tactical and administrative requirements in war. Hence, it is [our] conviction that a strong, stable and modern civil aviation component is essential for national security."

From the military standpoint, civil aviation makes its major security contributions through the aircraft and the air transport industries. There has been a great deal of talk and much confusion about the number of *(Continued on page 70)*

Congress has appropriated the money.
Now how will the Air Force spend it?

THE 70-GROUP AIR FORCE

B-50s will probably be mainstay of the Strategic Air Command, but only a handful have been completed.

By
RICHARD SAUNDERS
Washington Editor of FLYING

NOW THAT CONGRESS has voted the 70-group Air Force program, what was all the shouting about, anyway? What is the 70-group Air Force and when will we get it?

The legislation was passed over the opposition of President Truman, Defense Secretary Forrestal and top Army and Navy brass. There were more than a few Congressmen whose motives were somewhat mixed—they jumped onto the 70-group Air Force bandwagon merely to get themselves out of a dilemma on universal military training.

President Truman in his foreign policy has appraised the Red threat realistically. Nevertheless, he and Defense Secretary Forrestal tried to hold the line for a 66-group Air Force. At the same time, the top Army and Navy leadership showed less than military statesmanship when they began wailing about "balanced appropriations for defense"—like spoiled children clamoring for more cake because "Johnny got a bigger slice than we did."

And in the controversy which has now been settled in favor of a bigger Air Force, military air officials themselves were not wholly free of criticism. Both Air Force and Naval air arm officers nudged themselves out of bounds by trying to place orders for new planes before Congress had officially passed the bill or the President had signed it. There were brusque summonses to the White House woodshed—and a very active place it has been in the past few months.

What really counts now, however, is that the important point in the whole controversy has finally been grasped—the need to build up productive facilities to the point where they can sustain an adequate air force.

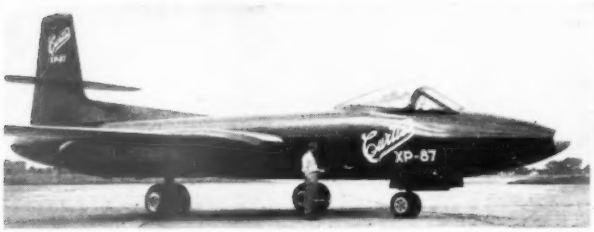
First, let's clear up a few false impressions. The issue was not whether we should or should not have a 70-group Air Force. Both the Administration and Congress agreed that an air force of this size is necessary and that we would have to embark on a long range procurement program to get it. Both agreed that we would have to start immediately to reach this minimum strength by 1951 or at the outside, 1952. These are the dates on which the Finletter and Brewster-Hinshaw Aviation Policy committees predict Russia will have the atom bomb.

The 70-group total, incidentally, is not just a figure pulled out of a hat. It is based on the calculated minimum security needs of the country. It was first fixed as a desirable goal back in the summer of 1946 by General Eisenhower—before the Air Force achieved equal status with the Army and Navy.

Where, then, lies the difference between these two plans for bringing the present 55-group Air Force up to the agreed size in five years?

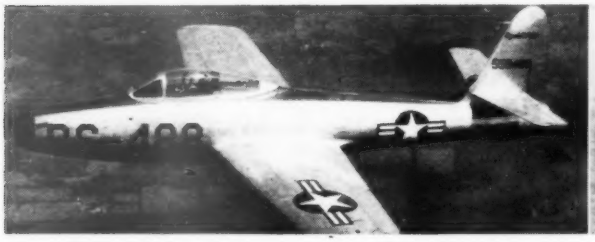
The difference is in quality. As *(Continued on page 78)*

SOME PLANES OF THE 70-GROUP AIR FORCE

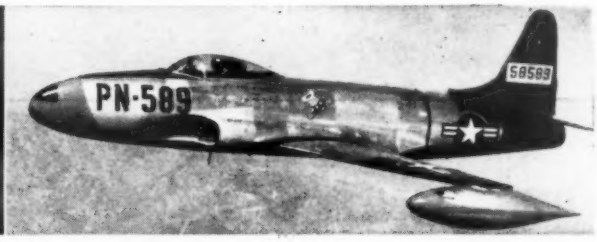


Four-jet Curtiss P-87 will go into production with major changes.

North American B-45 (four J-35 turbo-jets) goes into operation soon.



Republic P-84 fighter squadrons now exist. More will be activated.



Lockheed P-80 has advantage of three years' operational proving.

Here's What the 70-Group Air Force Means

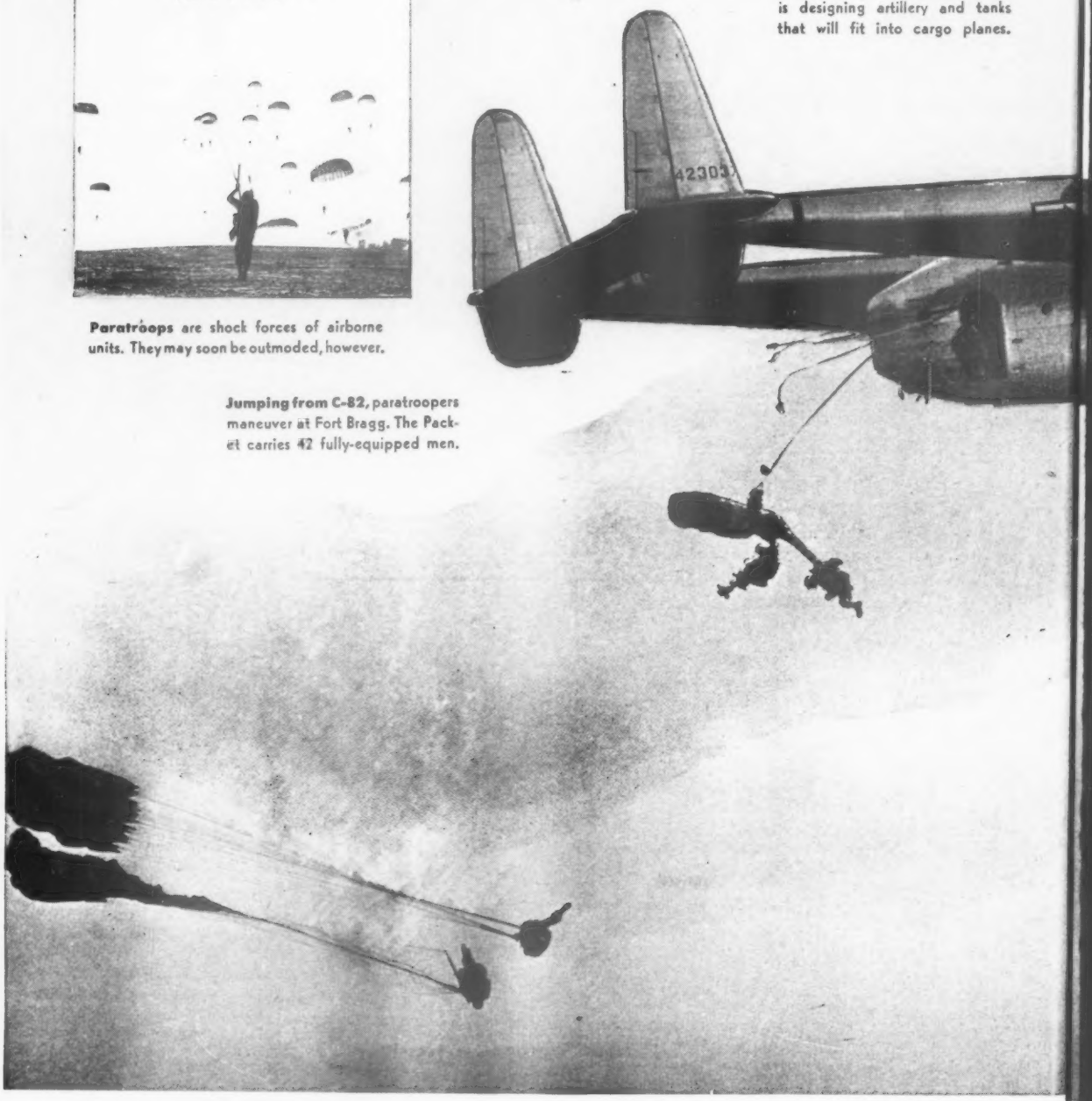
	GROUPS	PLANES	MEN
Regular Air Force	**70***	**6,869**	**502,000**
Air National Guard	**27**	**3,212**	**57,946**
Air Reserve	**34**	**2,360**	**122,000**

***21 Heavy Bomb Groups**	**4 Tactical Reconnaissance Groups**
5 Light Bomb Groups	**5 Long-Range Reconnaissance Groups**
22 Fighter Groups	**10 Troop Carrier Groups**
3 All-Weather Fighter Groups	**22 Separate Squadrons**

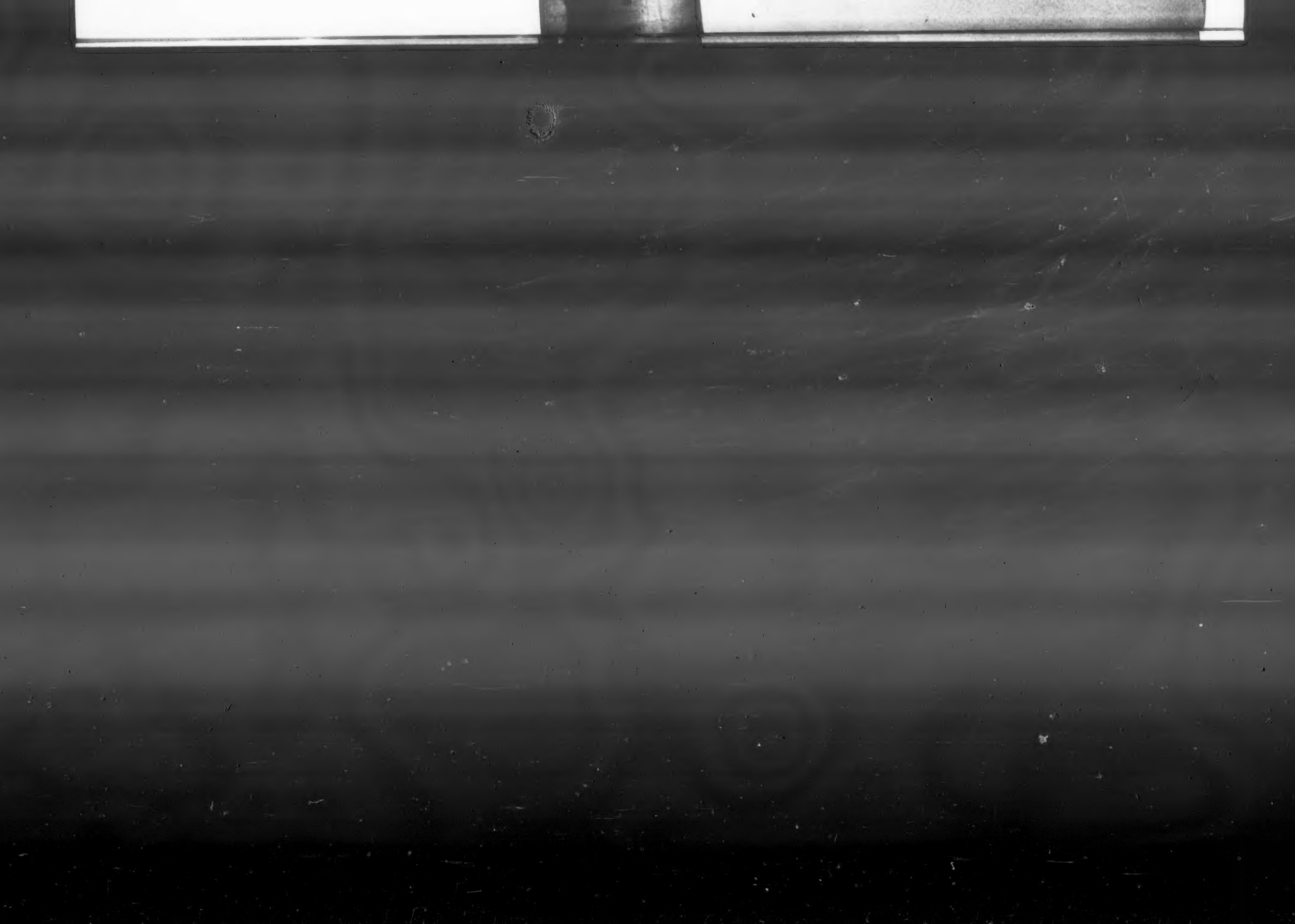
North American P-86 has a GE J-35 turbo-jet, top speed "over 650 m.p.h."

Paratroops are shock forces of airborne units. They may soon be outmoded, however.

Major problem for air planners is designing artillery and tanks that will fit into cargo planes.



Jumping from C-82, paratroopers maneuver at Fort Bragg. The Packet carries 42 fully-equipped men.



THE NEW LOOK IN AIR ARMIES

What do we have in airborne equipment? And what are our limitations?

By ROBERT W. MARLOWE

SINCE WAR'S END, newspapers have been filled with military speculation on air armies—on the effect of vast airborne attacks launched against targets well within enemy frontiers.

Comment has ranged from the overly-optimistic:

"Entire air transported armies may be landed in the heart of an enemy homeland, and wage their war from within—supplied, equipped and reinforced entirely by air."

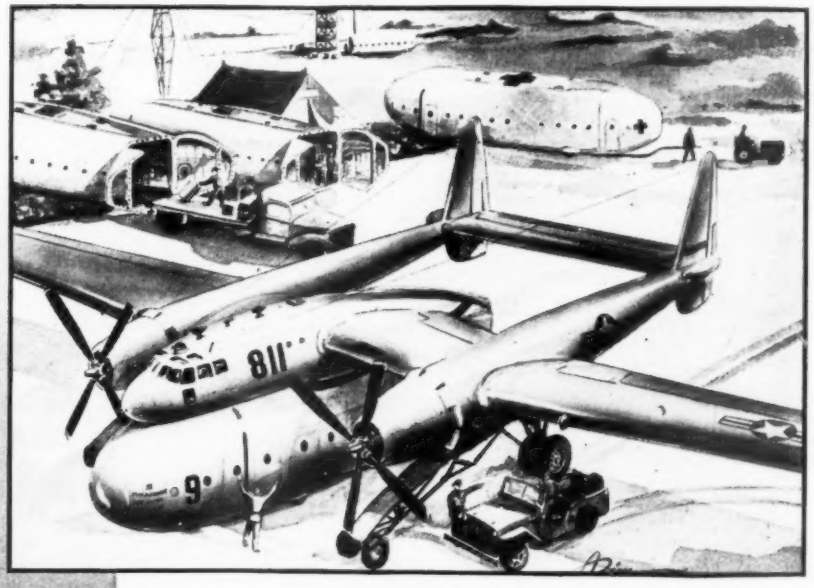
To the much more conservative:

"Ground-supplied infantry can't be supplanted in modern warfare. Even if airborne armies were a possibility (and today they are not) the foot soldier, dependent upon ground-force supply, will always deal the decisive blows."

The truth lies between these two extremes.

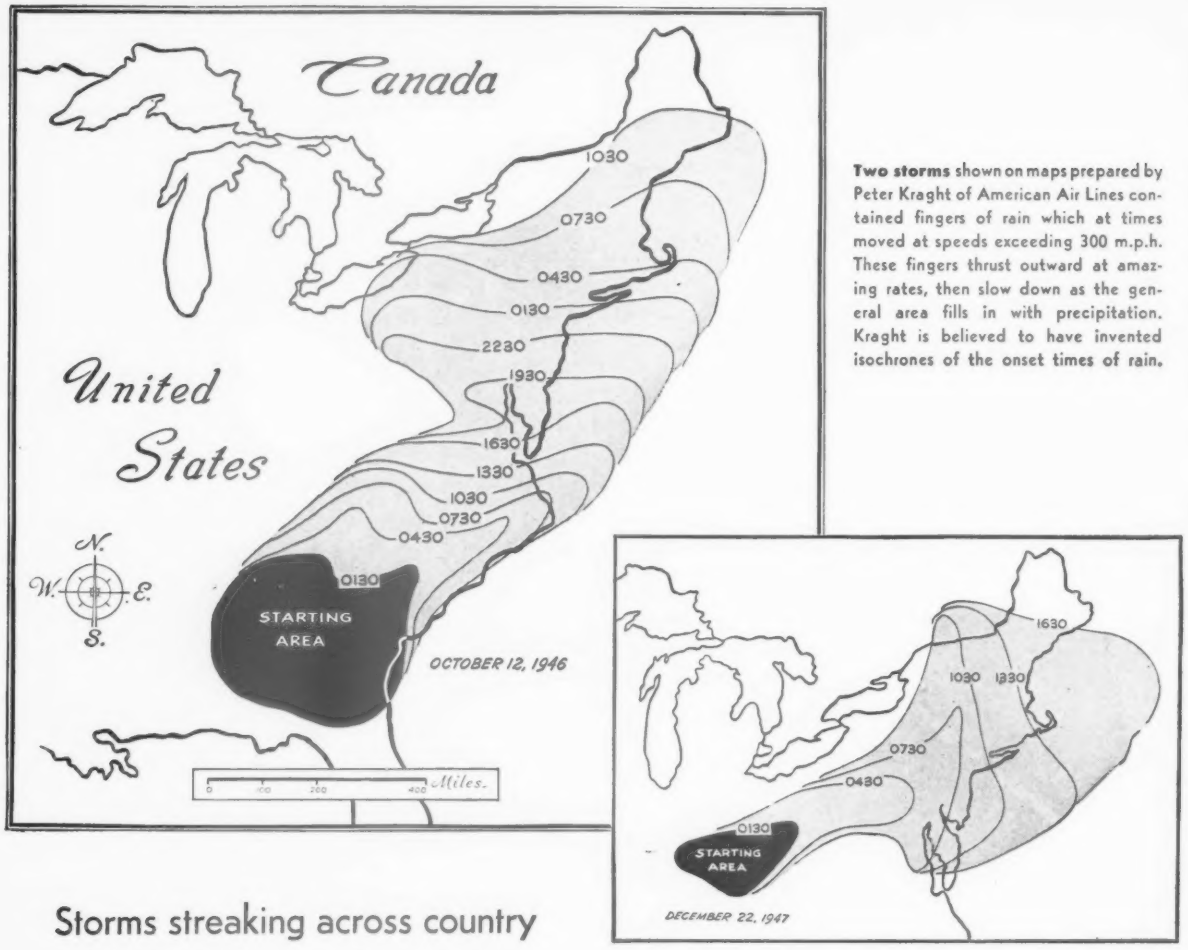
Air-borne and air-supplied task forces are a possibility today; but the truly large-scale air operation could not be achieved if war were to come tomorrow.

Reasons are obvious. The Air Force does *(Continued on page 58)*



Pod-type transports like Fairchild's proposed C-120 may form the backbone of future air armies. Its nine-ton detachable cargo compartment, when unhitched from the airframe, could be shuttled about on the ground or used for shelters.

DETROIT PUBLIC LIBRARY



Two storms shown on maps prepared by Peter Kraght of American Air Lines contained fingers of rain which at times moved at speeds exceeding 300 m.p.h. These fingers thrust outward at amazing rates, then slow down as the general area fills in with precipitation. Kraght is believed to have invented isochrones of the onset times of rain.

Storms streaking across country at 300 m.p.h. mystify scientists.

Mystery of the Racing Rain

By HY SHERIDAN

EVERY man loves a mystery. Well, here's the latest mystery and it's in the field of weather. It is serious because until it is solved weather forecasts and "alternate airports" are on strictly a maybe basis. Your guess as to the explanation of the mystery is as good as that of the next man, for expert meteorologists themselves admit that, using a singularly appropriate idiom, they haven't the foggiest notion.

So it can be seen that this is an emergency. It is serious. We must find out the cause of weather delinquency or we cannot safeguard aircraft by means of weather forecasts.

Do you believe that it is possible for bad weather, accompanied by rain or snow or mist, to shoot along across the country at 300 m.p.h.? Bad weather fronts have been clocked at that speed recently, and on so many occasions that our scientists have been jolted to their Phi Beta keys. They know now that we have always had the condition and that it is responsible for many airplane crashes and flying-weather emergencies. Pilots have been caught and weather men have gone home and stared at their old textbooks with the dazed and disillusioned eyes of a child who sees Santa Claus shiver on a mild winter day in Pumpkin Center.

Bad weather advancing at 30 or 40 m.p.h.? Yes, we can understand that, but 300 m.p.h.! As Sadie the Stewardess said when she tried the new styles, what goes on here?

As the precipitation pattern develops and advances it makes a peculiar appearance indeed. A finger of precipitation will suddenly poke out from the general area of the weather mass and go galley-wompus across the country at 100 to 300 m.p.h. for a distance of 100 to 600 miles and then slow down to normal. Usually another finger or tenacle will protrude on a nearby radius and do much the same as its brother. Afterward the open space between the two fingers will gradually fill in with precipitation.

Peter Kraght, chief meteorologist for American Airlines, uses two vivid figures of speech to describe the appearance of the area as it develops. He says *(Continued on page 72)*

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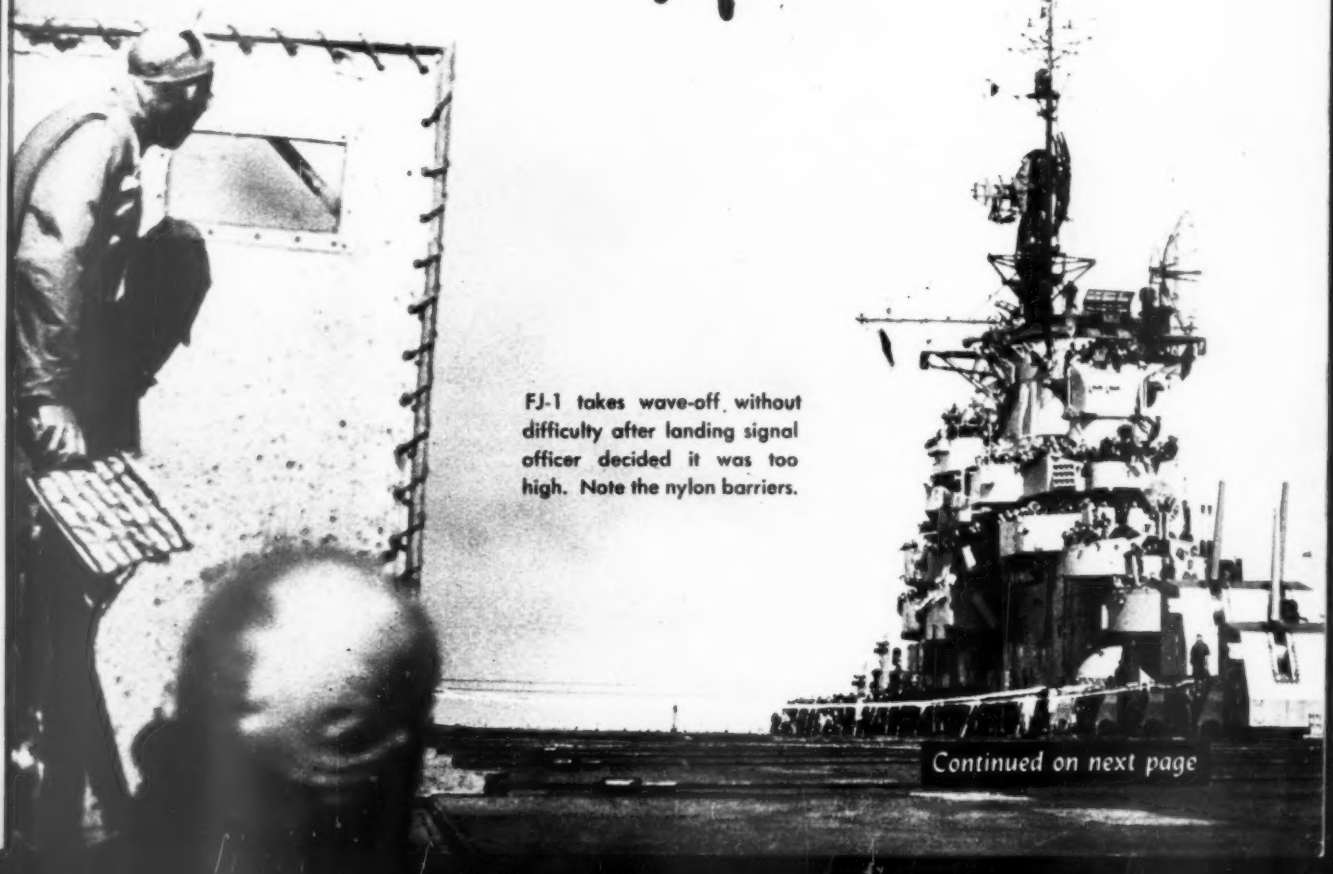
72)

Jets on a Carrier

Jet planes can use carriers but we still have no operational squadrons.



FJ-1 takes wave-off without difficulty after landing signal officer decided it was too high. Note the nylon barriers.

Continued on next page

North American FJ-1 approaches for landing on Carrier Boxer during recent tests.

Hook is down to catch arresting cables. Note level attitude of plane in landing.

Wheels touch with plenty of deck room left. Plane pulled out 91 feet of cable.

Deck handlers unhook arresting gear, being careful to stay out of hot jet blast. At right, plane is lowered by elevator and pushed into hangar deck for refueling. Pilot is Lieut. Comdr. Robert M. Elder.

Evaluating jet tests are, left to right, Vice Adm. George D. Murray, Rear Adm. William K. Harrill, and jet pilots Aurand and Elder.

JETS can land on and take off from big aircraft carriers; this fact has been demonstrated conclusively. They can also fly 200 m.p.h. faster than conventional Navy fighters. They are, nevertheless, a long way from operational use on carriers despite the general impression to the contrary.

Besides the North American FJ-1, shown here on the carrier *Boxer* during evaluation demonstrations recently, Lockheed P-80s and McDonnell *Phantoms* have also landed on and taken off from carriers. The Navy has one operational *Phantom* squadron and has recently activated an FJ-1 squadron.

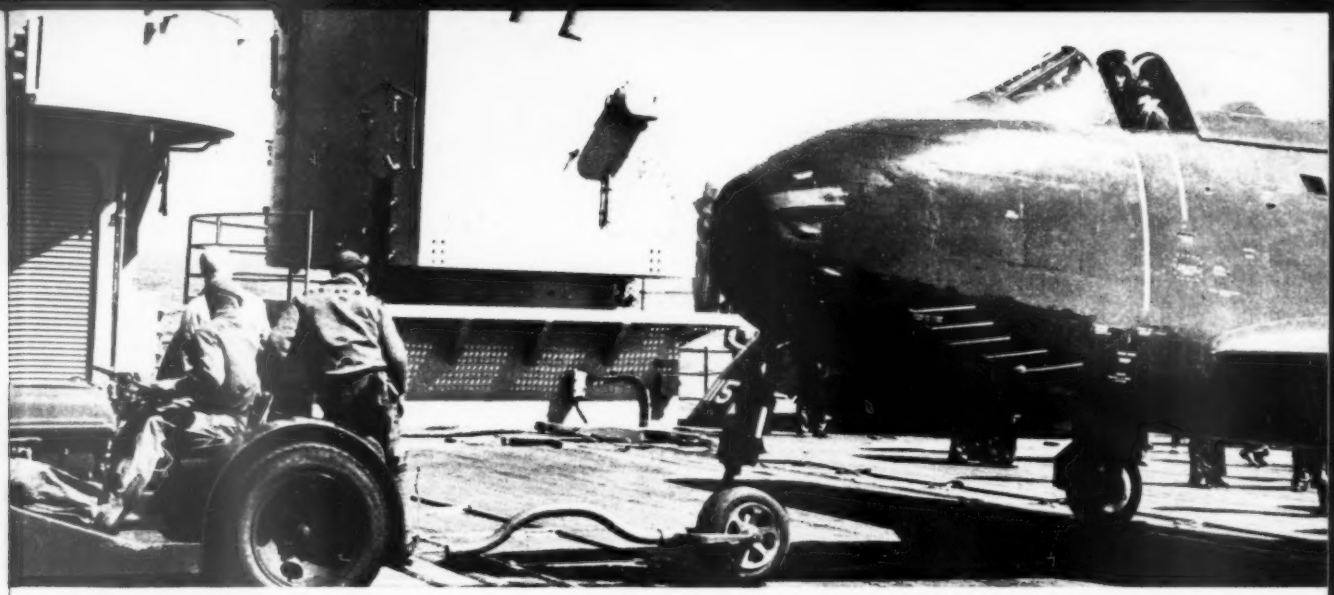
But neither is operational aboard a carrier. Only two planes were on the *Boxer* at any time during the FJ-1 tests pictured here. Reason: the Navy still doesn't know how it can handle more than a few jet planes on the same flight deck at the same time.

Engineers sought to solve this problem in the FJ-1 by building in provision for it to "kneel." The front gear has a sort of elbow on it with small auxiliary wheels. When the plane rests on the small wheels its nose is almost on the deck and its tail pointing up into the air, blasting away more or less harmlessly. If this idea works out, the deck problem should be fairly well solved but it isn't as yet.

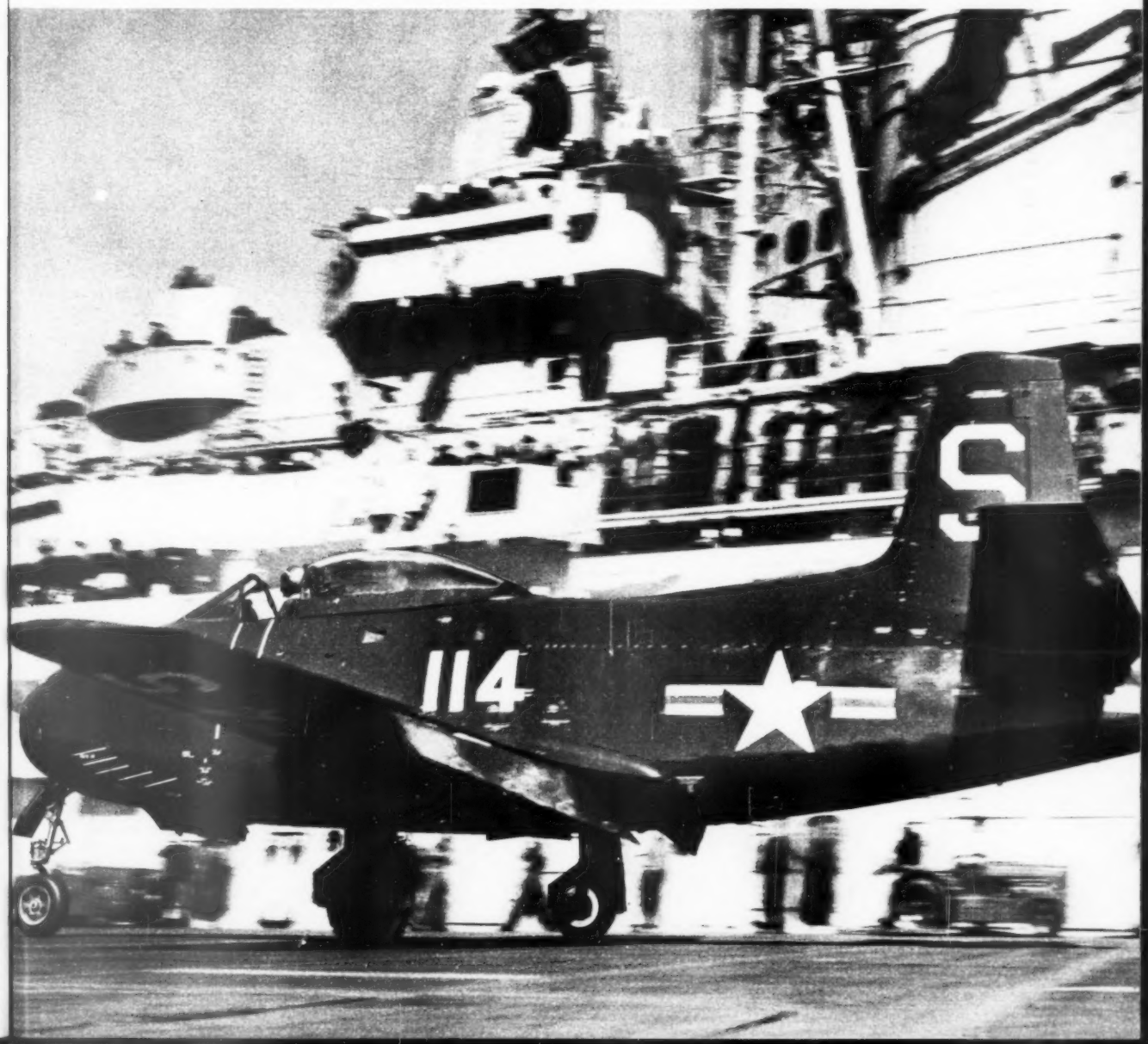
The stench of the exhaust is very bad and pilots waiting for take-off behind the lead plane cannot tolerate it. In addition, its very force is dangerous to planes waiting in its blast.

Jet fighters have shown another weakness *(Continued on page 82)*

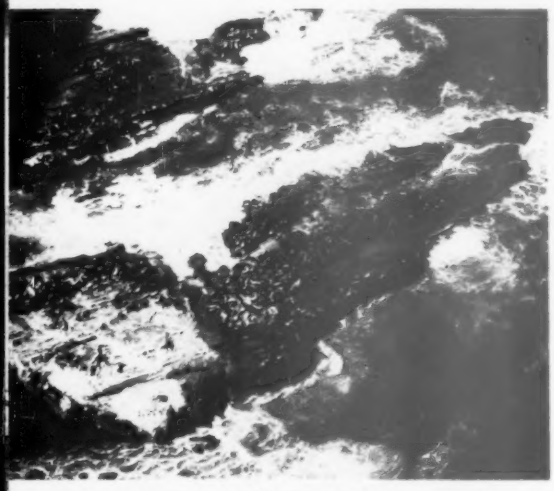
PHOTOGRAPHS BY DON DOWNIE



Take-off without catapult (below) is still a problem for jets. Half-way down the deck, the FJ-1 hasn't yet lifted its wheels off. On this take-off it used most of 888-foot flight deck despite a 41-m.p.h. deck wind. Above, the FJ-1 is towed to an elevator for refueling. Jet fuel consumption is high.



Seeding plane, a Cessna, is loaded in Arizona. Craft was able to reseed over 50,000 acres in less than a summer. A 700-pound load can be carried by the plane on each trip.



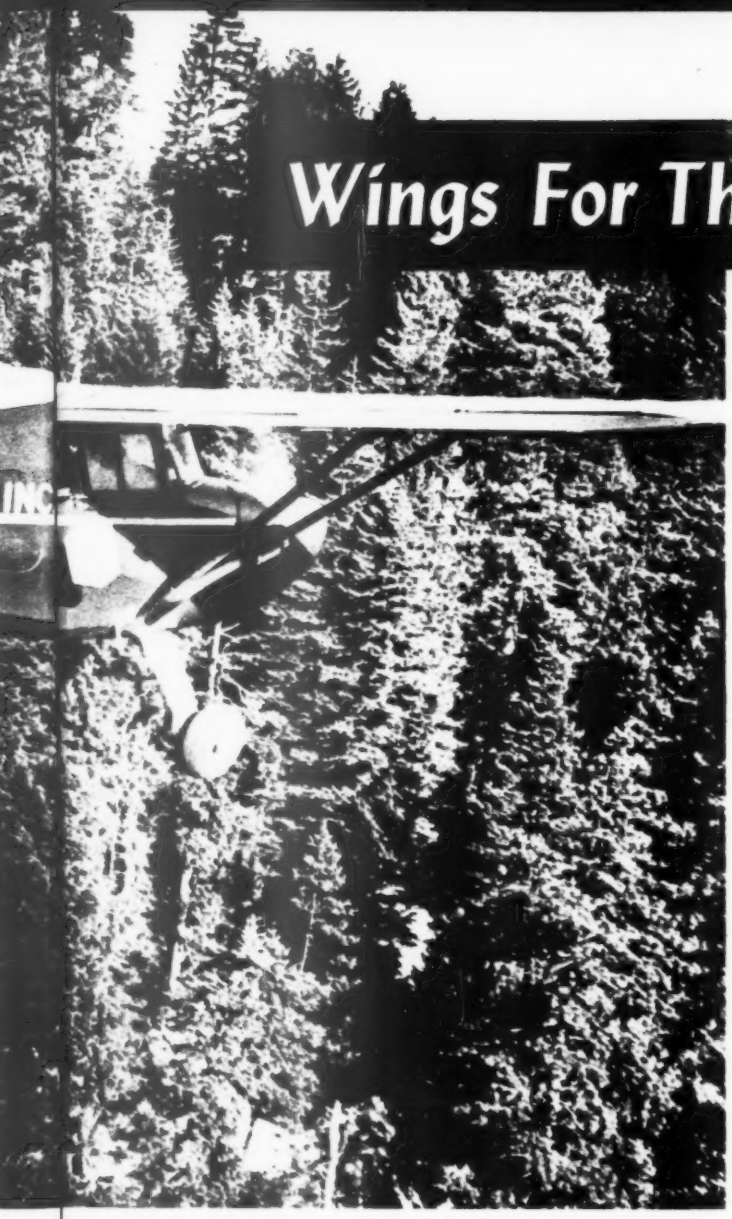
Sea lion census is taken from a California conservation Fairchild F-24, flying over Ana Nuevo Island. The plane is also used for enforcement, research and propagation.

Salt block, weighing 50 pounds, is dropped in Idaho mountains to provide artificial salt licks for wild game. About 250 tons of salt will be planted during 1948.

Workhorse of the New York State Conservation Department is a Grumman Goose, being loaded with trout for stocking remote Adirondack lakes and ponds. Fish are dropped without harmful effect when lakes aren't big enough for landing.

Flying sharpshooter of the Oregon State Game Commission holds a coyote bagged from Piper Cub. Predatory animals are hunted effectively by air.

Wings For The Game Warden



Thirty states use airplanes for a variety of conservation tasks.

By ISAAC D. CHAPMAN

THE MODERN GAME WARDEN doesn't skulk behind trees, searching for lawbreakers. He pilots a plane—and plays a vastly more varied role than that of catching over-optimistic hunters and fishermen.

Thirty states today use airplanes regularly in conservation work, and most of the other 18 have plans for air programs. Two years ago, only a handful of states used "conservation planes"—primarily for game surveys and spotting forest fires. Aircraft have now proved so effective that they're utilized for enforcement, research, restocking, conservation advancement, planting and propagation—even for dropping salt to game animals which might otherwise die from excessive heat.

The plane's advent into conservation work was rapid. Ten years ago only five state departments used them. But today's list stretches long: Arizona, California, Colorado, Connecticut, Georgia, Idaho, Illinois, Iowa, Louisiana, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New York, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Texas, Utah, Washington, Wisconsin and Wyoming.

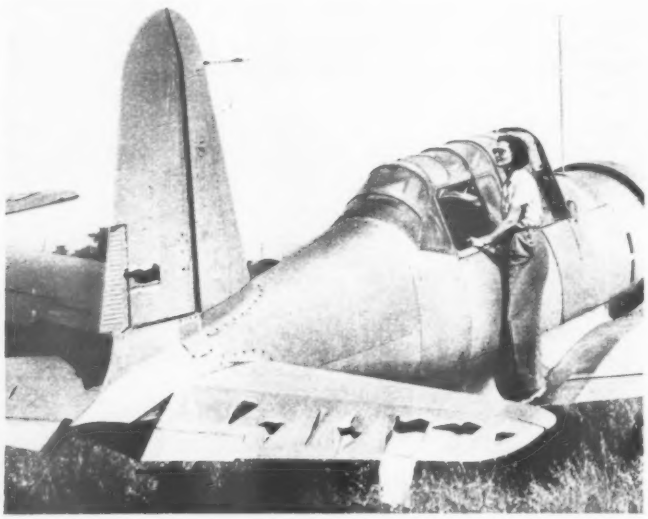
Conservation departments have used ingenuity in putting their aerial workhorses to use. In California, the Division of Fish and *(Continued on page 81)*

"Planting" fish is old story for conservation agents in west. Here, 10,000 fingerling brook and rainbow trout are dropped near Sun Valley.

Dinner for ducks is dropped from a plane in Louisiana. Food was provided twice a day for the wild fowl after they had gobbled up 100 acres of rice, ruined by a hurricane. After the land was posted, an estimated 500,000 to 1,000,000 ducks were fed.

Grounded by CAA, this PT-19 was sold by owner for salvage just one year after he purchased it at a surplus sale for $1,600. Training planes were put on market in wholesale lots by the WAA. Over 11,915 primary, 8,670 basic and 4,775 advanced trainers were purchased by U. S. aviation interests.

A white elephant, this BT-13 has seen its best days. Notice oil blown back on fuselage by the 400-h.p. Wright engine's exhaust.



Fabric deterioration is rapid under hot sun. A battered relic, this plane may never fly again. Instruments in rear cockpit have been removed.

Surplus Planes–A Bargain?

Optimistic pilots find it isn't the first cost, it's the upkeep.

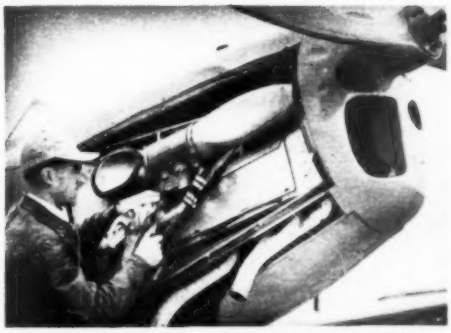
SO YOU bought a surplus plane? And you ran into trouble? Bills for repairs, insurance, overhaul, gas and oil are piled to the roof and blowing out the front doors? Move over, brother, you've got lots of company.

Over 35,000 surplus airplanes have been purchased by civilian pilots since war's end. The aircraft sold for bargain-basement prices—and many were grabbed by flyers who dreamed of cross-country pleasure flights in heavy ex-military airplanes.

But the average pilot discovered that he stepped into water a little over his head. The initial cost was deceiving; it was what came later that caused the trouble. And unless he was in business for himself—skywriting, instrument instruction, crop dusting, or in a spot where he needed *and could pay for* high-speed executive transportation—he found the going pretty rough.

Here are some typical examples:

A west coast owner of a surplus Vultee BT-13 picked up his plane for a song. Then he began to check maintenance costs and discovered to his dismay that a well-established maintenance shop (Pacific Airmotive) quotes the following prices: $400 for a top overhaul on the engine, and $1,000 to $1,500 for a major; $200 to $400 for removal and re-installation of the engine; $52 (airframe) *(Continued on page 48)*



Overhaul on surplus engines such as this 175-h.p. Ranger will cost owners between $1,200 and $1,400

Surplus planes clutter a Los Angeles field. The twin-engined Cessna in background sold for $100.

Chartered plane at Twentynine Palms, Calif., is a surplus Cessna UC-78. Operators have been able to put many of these larger planes to good use, but their hourly cost is high—about $35, including maintenance. Since the end of World War II, the Government has sold more than 2,900 light transports.

Vibrating rods, called "haltares," enable flies to maintain flight equilibrium. One haltare is located behind the base of each wing (note white knob-like appendage on model).

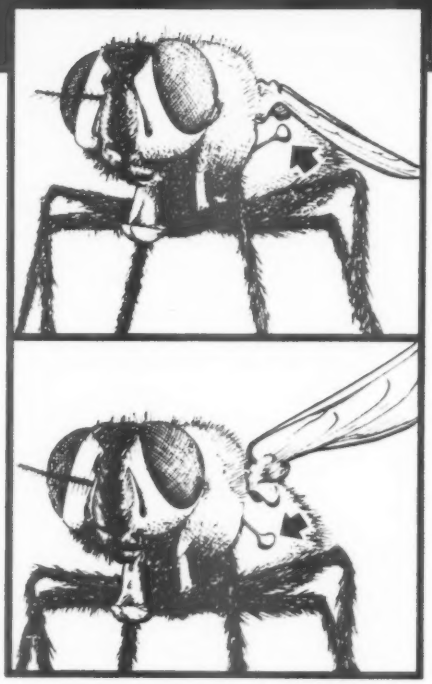
The House Fly's Hidden Gyro

By WILLIAM A. PRICE

A 75,000,000-year-old embalmed fly might have knocked a sizeable dent into the ego of the Sperry Gyroscope Company of Great Neck, New York, if Sperry had decided to resent it instead of learn from it.

The tiny insect, about a quarter of an inch long, is a fossil in transparent amber—ossified resin which originally trapped the specimen for posterity. Microscopic investigation shows the fly carried, as its own personal equipment, a gyro-stabilizing device for flight control. The device is a set of "haltares," two short, vibrating members, shaped like rods. They are common to all flies—but are found in no other insect or flying animal.

The haltares give the fly built-in IFR instincts so that they have been doing naturally for well nigh 200,000,000 years what the late Dr. Elmer A. Sperry's little devices have done (*Continued on page* 80)



Fly's tiny gyros operate at same speed as the wings (about 150 times per second) but move in the opposite direction. Note relationship to wing position.

General 'Van'

New Air Force chief of staff is the youngest full general in U. S. military history.

Gen. Hoyt S. Vandenberg, 49-year-old head of the newly-independent Air Force, commanded the Ninth Air Force during war. He participated in Allied conferences at Quebec, Cairo and Teheran, where he was known for successful negotiations with the Russians. As a major general (right) he flew combat missions in North Africa.

By JOHN A. GILES

JUST what kind of man is Gen. Hoyt Sanford Vandenberg and how did he get to be chief of staff of the newly-independent U. S. Air Force?

Briefly, a "million-dollar personality," top-notch flying ability and perhaps the oft-times unconscious influence of an uncle who happens to be a key U. S. Senator are the cardinal points in his success story.

Tall (six feet) and gregarious, he is the airman's idea of what the airman should look like. He is slim, soft-spoken and mildly profane, and his prematurely gray hair contrasts with a smooth complexion and youthful face.

He can fly almost any type of plane, and still keeps his hand in. He had a fine combat record in World War II.

On the debit side, some critics vehemently charge that he is short on administrative ability and that he has been guilty of poor judgment in the past. His friends, when pressed, will admit that perhaps Van becomes sold on an occasional "smoothie and refuses to become unsold for any amount of money." There seems to be some agreement that the general, like many another affable person, sometimes is a poor judge of personnel.

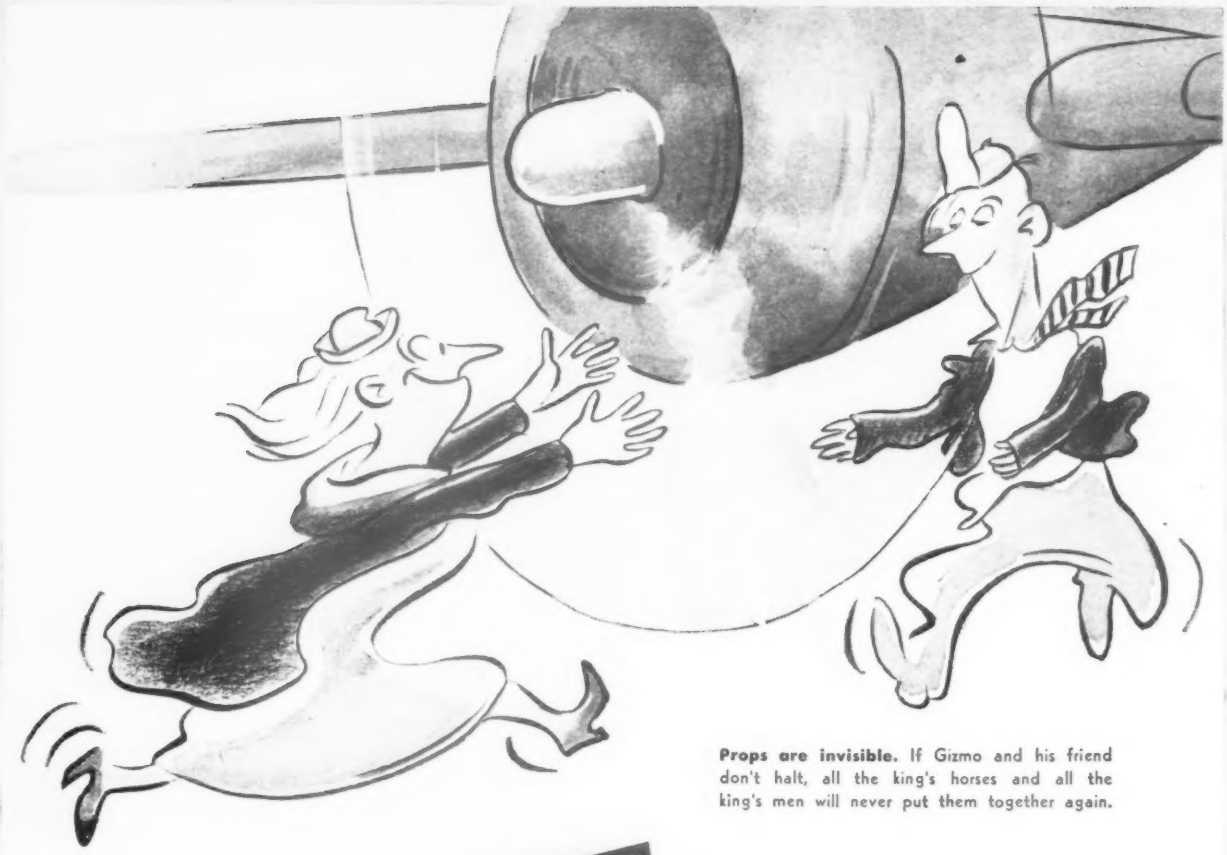
His friends deny that Uncle Arthur H. Vandenberg, the president pro tem of the Senate, who yet may emerge as a dark-horse Republican Presidential candidate, has had absolutely anything to do with the general's comparatively rapid rise. Van, they say, has done everything to keep from being accused of that. And, in fairness to the general, that is probably true.

However, there is no denying that he is his uncle's favorite nephew. This was discovered by a high ranking officer who became concerned with General Vandenberg's rather short-lived direction of the Central Intelligence Agency, the nation's top intelligence unit.

This officer complained that the general used poor judgment "by his adamant insistence" on the elimination of secret intelligence nests of all other Government departments except CIA: that he chased the Federal Bureau of Investigation out of Latin America; and that he reduced the foreign broadcast intelligence service to the point where it was nothing more than a monitoring service. The officer became alarmed and took it upon himself to appeal to a highly placed White House aide.

The adviser heard the story through to the end—and then, with great candor, said:

"Why sir, don't you realize that there is nothing that can be done? The Administration needs *(Continued on page 76)*



Props are invisible. If Gizmo and his friend don't halt, all the king's horses and all the king's men will never put them together again.

PROPS Are Poison

CARTOONS BY FRANK ADAMS

To all who regard longevity as an aim in life: Stay away from the business end of a propeller.

AN unfortunate fact about propellers is that few persons who learn about them the hard way ever have a chance to use their knowledge afterwards. The reasons why are easy to find. A little booklet by H. G. Crowley, accident analysis division of the CAB, recently pointed out that when a headsman swings his axe he uses one manpower for only one stroke. But a propeller is swung by many horsepower in multiple strokes. A moving prop resembles a blurred disk. It is nearly invisible. Absentminded persons, and persons who don't know about props, too often encounter them with unfortunate results. People don't walk into buzz saws because they can see them. A turning prop is even more dangerous than a buzz saw. It is also dangerous when it isn't turning. One spectator, walking through a hanger, had a sudden urge to spin a propeller. The engine started and the prop cut off three fingers. This is a minor accident for a propeller! Make it your job to keep careless and ignorant persons from tangling with props. The records show that half such encounters end in the hospital or the morgue. END

Nonchalance is foolish around a turning propeller. If Gizmo doesn't watch out, his fingers will follow the banana.

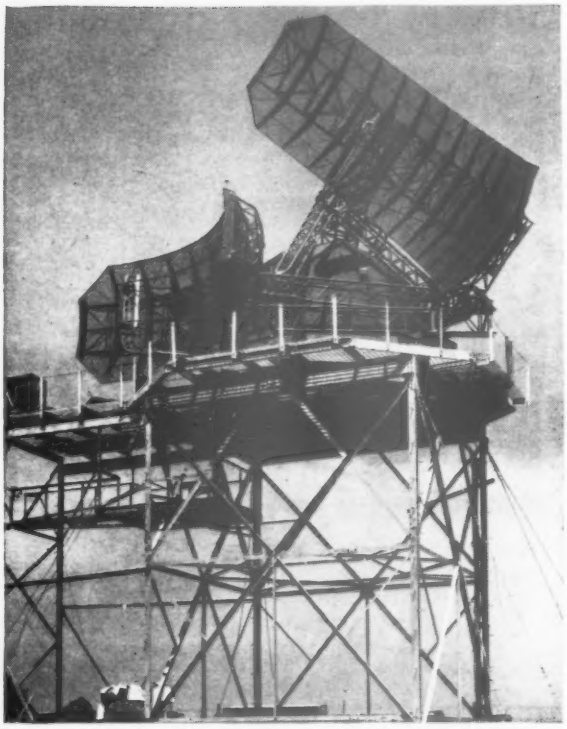
A prop has no brakes. Even cutting the switch won't stop it in time to prevent Gizmo from walking into it.

Which way? Gizmo finds it's just as easy to go forward as backward.

Brilliant contrasting colors on blade tips help make props visible. Fancy designs may not be necessary, but at least Gizmo sees the light.

The On-Time Airline

By CURTIS FULLER
Managing Editor of FLYING



Surveillance radar antenna at Jamestown, O., is one of new air traffic aids which may be used on future airways. This radar records height and position of planes over 250-mile radius.

Fair weather or foul, the All Weather Air Line flies a regular schedule every day.

THE C-54's four engines were roaring throatily as we sat on the end of the runway. It was cold outside and not too warm inside. Standing on the metal floor behind the engineer in his jump seat, I shuffled my feet and was sorry I hadn't borrowed a pair of flight boots. Lieut. R. A. Tucker, the navigator, was giving a last check to his navigation problem. Capt. R. R. Spradley, the pilot, was sitting in the right hand seat.

Spradley motioned to me to put on the earphones. He explained that one of the navigating instruments wasn't working well, so he had reversed positions with Capt. W. J. McCleary, the safety pilot, and would fly from the right seat all the way in to Washington.

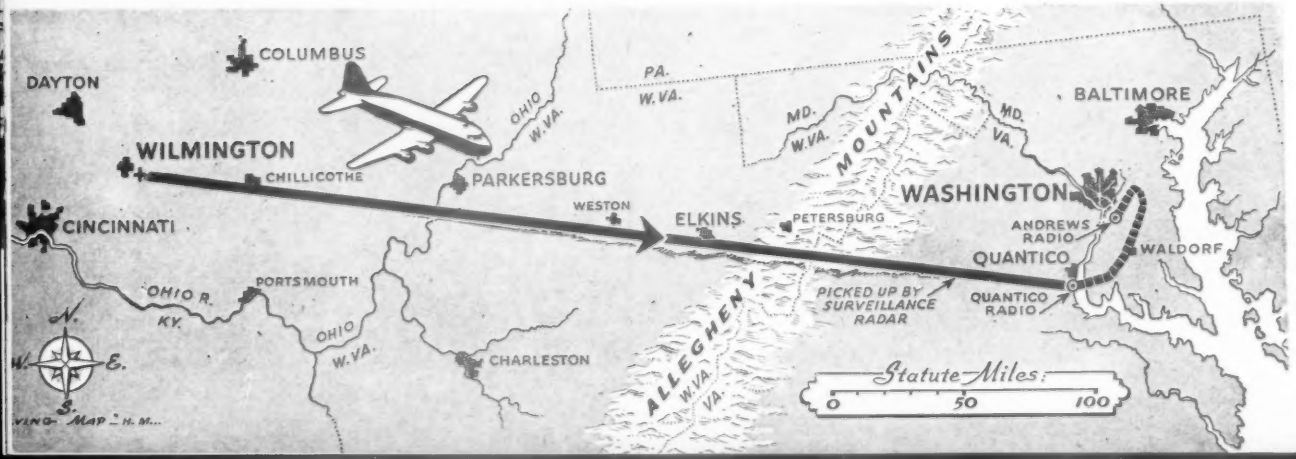
We were Plane No. 603, waiting to take off blind from Clinton County Air Field at Wilmington, O., for Andrews Field, Md. We were carrying 13 passengers, seven crew members including two stand-bys, and 2,750 pounds of electrical appliances and copper cable as cargo. Our take-off, entire flight, and landing would be under simulated blind flying conditions, for this was the Air Force's famed All Weather Air Line. Since its inception August 1, 1946, the line had flown a daily round trip from the All Weather Flying Center's headquarters in Ohio to Andrews Field.

When the air traffic control systems and flying techniques worked out by the All Weather Flying Center are applied to commercial airlines, there will be a revolution in U. S. air transport. Dependability like that achieved by the All Weather Air Line is unheard of in civilian air transportation, and though the new methods are not yet ready for air commerce, they point the way to the future.

Thirty seconds to take-off at exactly 9 a.m. Our true course would be 100°, which, with a drift of plus 1° and variation of plus 4° gave us a magnetic heading of 105°. We would fly at 7,000 feet aided by a 23-m.p.h. tail wind to make good an average ground speed of 218 m.p.h. Our ETA at Andrews Field was 11 a.m.

Nine o'clock. Captain Spradley, wearing blue goggles, shoved in the throttles and we were off down the runway. Our cockpit was completely shrouded in orange polaroid plastic. Everything in the cockpit was plainly visible in the amber light. Everything outside could be seen with an orange-amber tint until I slipped on a pair of blue goggles. Then the outside became stygian *(Continued on page 50)*

ROUTE OF THE ALL WEATHER AIR LINE



Larger nose wheel (5.00x5) gives improved rough or soft field performance.

Split elevator, a distinguishing feature of the 1948 model, is intended to eliminate rough weather instability.

1948 *Ercoupe*

New Ercoupe cruises at 110 m.p.h. on 85-h.p. engine. Shoulder straps are optional equipment: Price $25.

FLYING's CHECK PILOT

EDITOR'S NOTE

This series of articles is planned to help the pilot and prospective plane owner evaluate aircraft now on the market. Only aircraft holding a CAA Approved Type Certificate are flown. The author is not a professional test pilot. He evaluates each aircraft through the eyes of an average private pilot who flies an airplane either for business or sport.

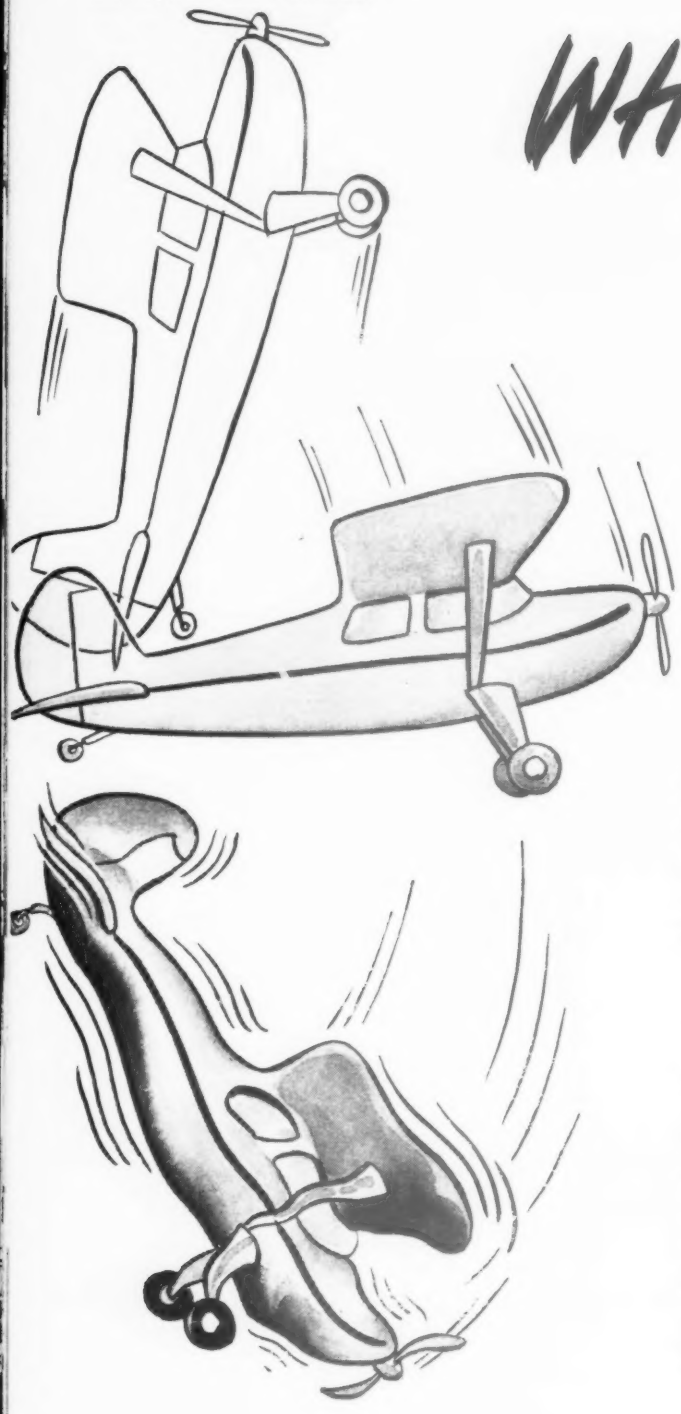
By MAX KARANT

THE ERCOUPE has had its face lifted a bit, and with interesting results. It's the same basic airplane—except for the slightly different paint job you would have to walk around it a few minutes to see the differences. Most noticeable are the new split elevator and the larger nose wheel.

There is an important difference under the cowl: the 75-h.p. engine has been replaced with an 85-h.p. Continental (fuel injection optional). With the plane's gross weight boosted to 1,400 pounds, very little of the *Ercoupe's* weight-carrying capacity is lost because of installing the larger engine.

I flew two new *Ercoupes* for this article, one of them at the factory just outside Washington, D. C. At that time I was accompanied by Bob Sanders, head of Sanders Aviation, Inc., new world-wide distributors of the planes. Sanders made a deal with the Engineering and Research Corporation to take over the sales *(Continued on page 73)*

The plane hangs suspended momentarily in mid-air. Suddenly the nose whips down. Then, watch out!



WHIPSTALL!

By
ELMER KLANDERUD

"STAY away from a whipstall," the Old Timer had said. It flashed through your mind . . . because you were in one.

All the stories you had ever heard about the whipstall blazed across your memory. The planes that had lost their tail groups in that vicious whipping downward movement of the nose, like the snap of a whip. The lightplane you had seen with its struts bent, fuselage twisted, so badly damaged that it would never fly again.

You thought of that time you spun out of the top of a loop. In the other cockpit was a student, a clear thinker and very fast. Faster than you realized. You told him that he was to take over as soon as the plane entered a spin, then close the throttle and recover.

"The object of these spins out of unusual positions," you added, "is to make you familiar with spins under all conditions, so that if you inadvertently enter a spin at low altitude you will recover promptly, with a minimum loss of altitude."

You dropped the nose and picked up some additional speed and pulled her up into a loop. The ship started up and back over to the inverted position and you threw your head back and caught sight of the horizon. As the horizon came into view you brought the stick back and gave it full rudder in the direction of the spin. You knew the plane would snap and then fall off into the spin. But it no more than started its snapping motion when you felt the controls move swiftly and definitely.

The student had mistaken the snaproll for a spin. His recovery was fast. The snap stopped within one turn. Something was wrong.

The plane was going straight up!

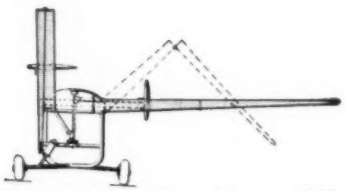
Fortunately there was still a little speed left so that when the stick was brought back again, the plane fell off into a normal spin.

That was close enough, as close as you wanted to get to a whipstall. Next time, you decided, you would use a little less airspeed so that the plane would fall into a spin without getting near a whipstall. But you still had a lesson to learn.

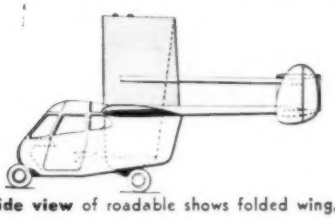
It all began when you were doing spins out of unusual positions: steep turns, lazy eights, *(Continued on page 68)*

Here's how it feels to be in the most vicious of all stalls.

Stout Skycar, designed by author in 1930's, had full-length auto-type doors and steerable four-wheeled chassis. Some of its features are discussed in this article. Stout (left) finishes work on a roadable model.



Hinged wings can be used on roadable.



Side view of roadable shows folded wing.

BILL STOUT SAYS:

Let's "Imagineer" a Roadable

MOST inventions result from piecing together a group of old ideas into a new form for a new function. They require as much new thinking as the imagination of the designer will allow.

This is true whether one devises a new safety pin or an atomic weapon, a wheelbarrow or a roadable airplane.

Before we start to make final decisions, therefore, we must be versed in those things that went before, that relate to the problem, so that we may have the maximum help from the past in our new thinking.

And in that past we will find a host of good ideas that were dropped, some for financial reasons, some for political, but nevertheless ideas that will someday be used when the buying public catches up.

Some of the ideas proposed for modern airplanes were used by aviation pioneers on the first planes built.

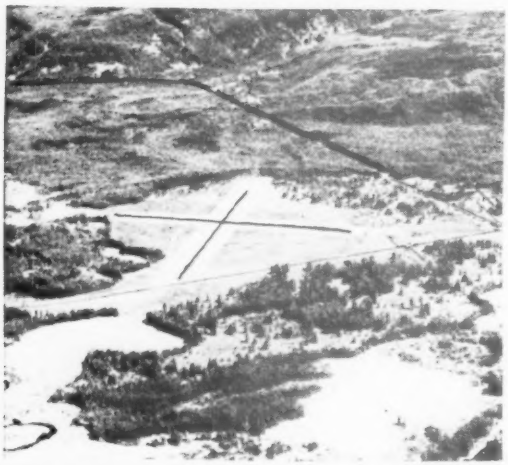
The Wright Brothers had fuel injection on their first plane; they had twin counter-rotating propellers—today's "latest touch" in high speed planes with props. They had the multi-wheel landing gear arrangement recently adopted by our DC-4s and DC-6s, and catapult take-off and arrester gear for landing in short space.

Dunn in the old days gave us swept-back wings — the "latest" on supersonic ships. Bleriot had a caster landing gear in 1907.

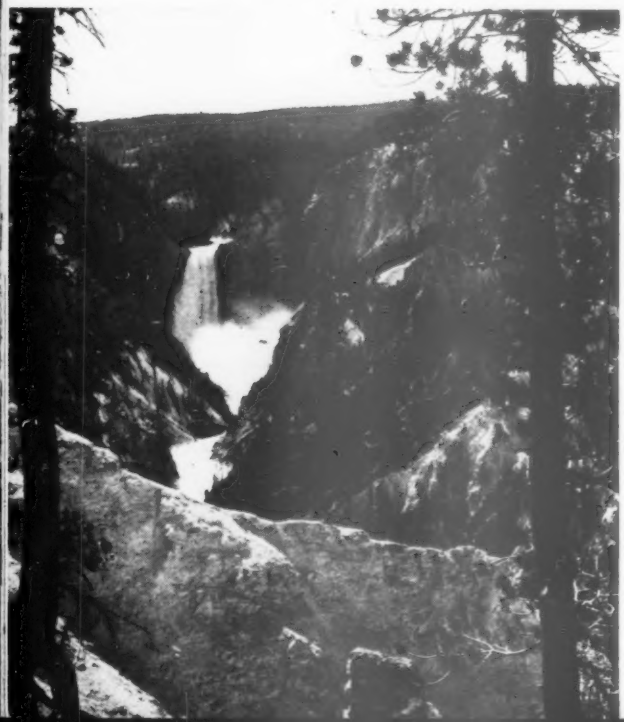
Even Wright Field (then McCook) muffed the adjustable pitch propeller when Hart brought it from the Coast and demonstrated it in flight. It was apparently forgotten until comparatively recent times.

Curtiss' three-wheeled landing *(Continued on page 62)*

Rainbows are among many varieties of trout in Yellowstone's remote streams. This catch weighed 35 pounds.



Big Springs Airport, near Park, is operated in conjunction with resort. Field was built by U. S. Forest Service.



Old Faithful, world's most famous geyser, spews thousands of gallons of water more than 150 feet into the air. It erupts about every 66 minutes.

Yellowstone canyon is a scenic attraction, with a waterfall which is more than twice as high as Niagara.

Tame bears in Yellowstone will beg for food. Tourists, however, are warned not to feed them.

A FLYING Holiday

Yellowstone Park

Wyoming rodeos, held near park, feature old-style western riding.

Eight good airports lie near this fabulous national park.

IN THE EARLY 1800's John Colter—discoverer of Yellowstone Park—became a U. S. laughing stock when he claimed he'd seen "steaming hot waters, coming from the ground" out in the Northwest Territory. Frontiersman Jim Bridger's story in 1830 of "towering spouts of water, shooting high in the air, regular as clockwork" earned him a national reputation as a liar.

Now, 118 years later, U. S. pilots are streaming in from all parts of the country to see the wonders of Yellowstone, just as Jim Bridger described them.

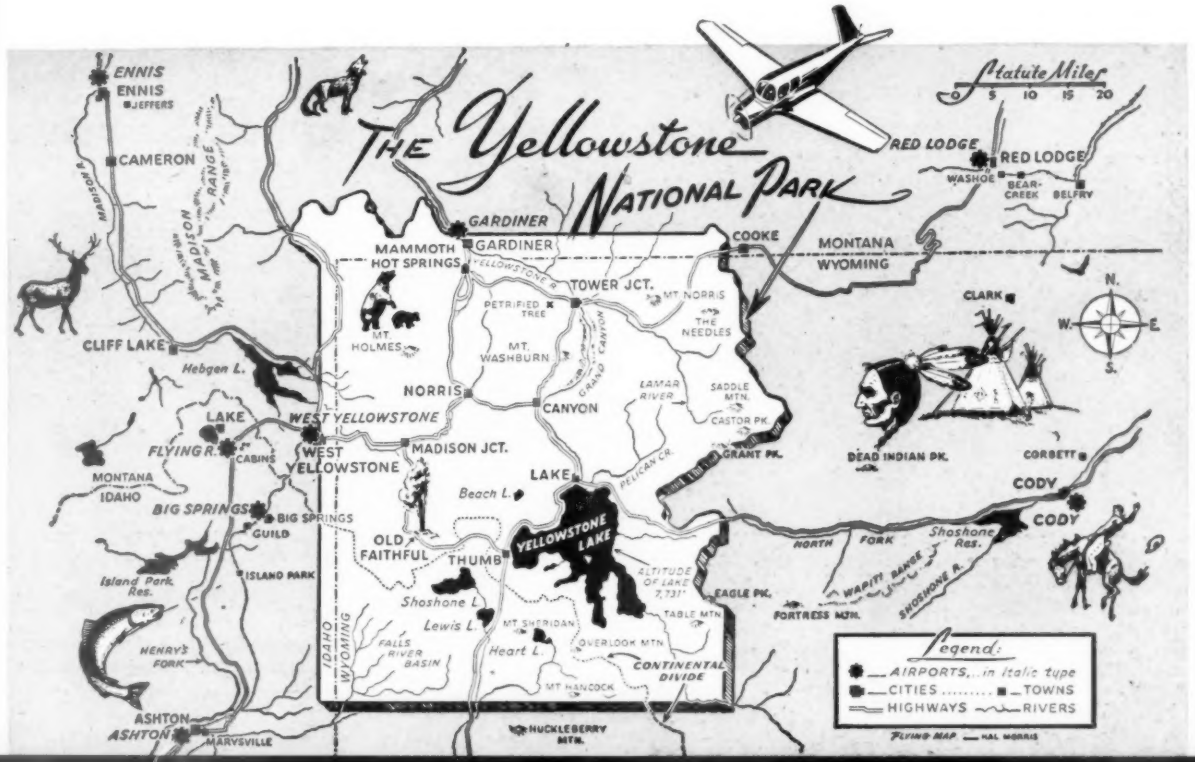
In a single small area, it's possible to try your hand at mountain climbing, fishing, horse-back riding, boating, hiking, sightseeing, photography, and general roughing-it. The country is wild, the terrain rugged. Even now, many of the airports don't have full facilities.

There are compensating factors, however. First among them is the fact that the pilot can find adequate facilities near the park, and can head out from airports into a region which, for natural grandeur and unspoiled beauty, is excelled by few in the world.

The park is open from about May 1 until September or October, depending upon weather conditions.

Largest of the national parks, Yellowstone covers approximately 2,213,000 acres, lying in the extreme northwest corner of Wyoming but including small portions of Idaho and Montana. Average elevation is between 7,000 and 8,000 feet.

Biggest handicap to the flyer is the National Park Service's horse-and-buggy ruling that airplanes cannot operate within the park. That does not prevent pilots from tying-down their planes at such nearby airports as West Yellowstone or Gardiner, Mont., or Ashton, Ida. From these towns it's possible to rent transportation *(Continued on page 66)*



HAVE YOU SEEN?

Chrislea Super Ace is new British four-placer with unified control system. It cruises 110 m.p.h. on 145-h.p. Gypsy Major.

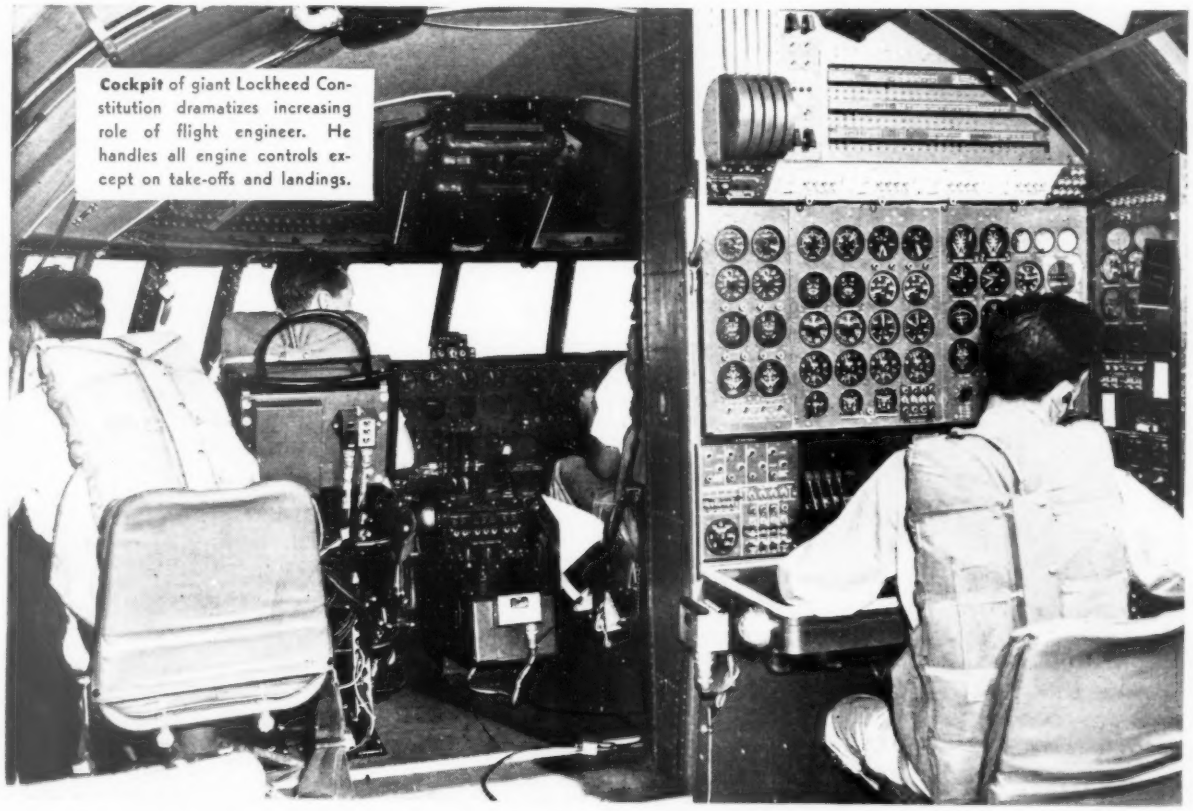
First two-place jet trainer in U.S. is Lockheed TF-80C, similar to the standard P-80 except for longer fuselage and canopy enclosing both cockpits.

BOEING XB-47 TAKES OFF AT 52° ANGLE WITH 18 JET ASSISTED

The largest concentration of power ever used on any known airplane is shown here propelling new swept-wing XB-47 bomber into the air from Moses Lake Air Force Base, Moses Lake, Wash. The plane was flown by Test Pilots Bob Robbins and Scott Osler. Taking off with its six

Avro Athena Mark 1 is new British three-place advanced trainer with Mamba prop-jet engine. It can double as bomber.

Newbury Eon is three-place British lightplane powered by 100-h.p. Cirrus Minor engine. It can be used as glider tow.



Cockpit of giant Lockheed Constitution dramatizes increasing role of flight engineer. He handles all engine controls except on take-offs and landings.

TAKE-OFF ROCKETS PLUS SIX 4,000-POUND THRUST JET ENGINES.

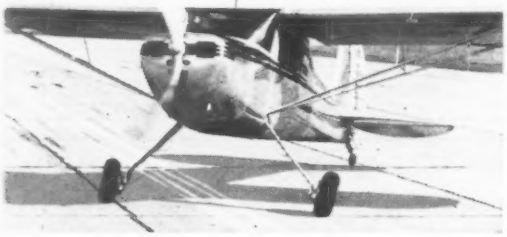
turbo-jet engines screaming, the bomber's bicycle gear had just come unstuck when Robbins fired the 18 JATO units. These rockets, mounted nine to a side, give 1,000 pounds of thrust each. The dramatic sequence pictured here shows the steps in the plane's steep climb-out.

HAVE YOU SEEN?
continued

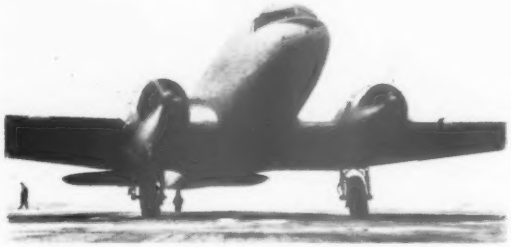
Overnight conversion changed notorious plane into just another civilian B-24. Chicago photographer A. R. Krieger snapped top photo late one afternoon when Reynolds-Boston Museum craft returned from abortive China expedition. At left is way plane looked next morning with its identifying paint all removed.

CROSS-WIND LANDING GEAR TESTED ON VARIETY OF PLANES

Aeronca Chum experiment proves value on tricycle gear.



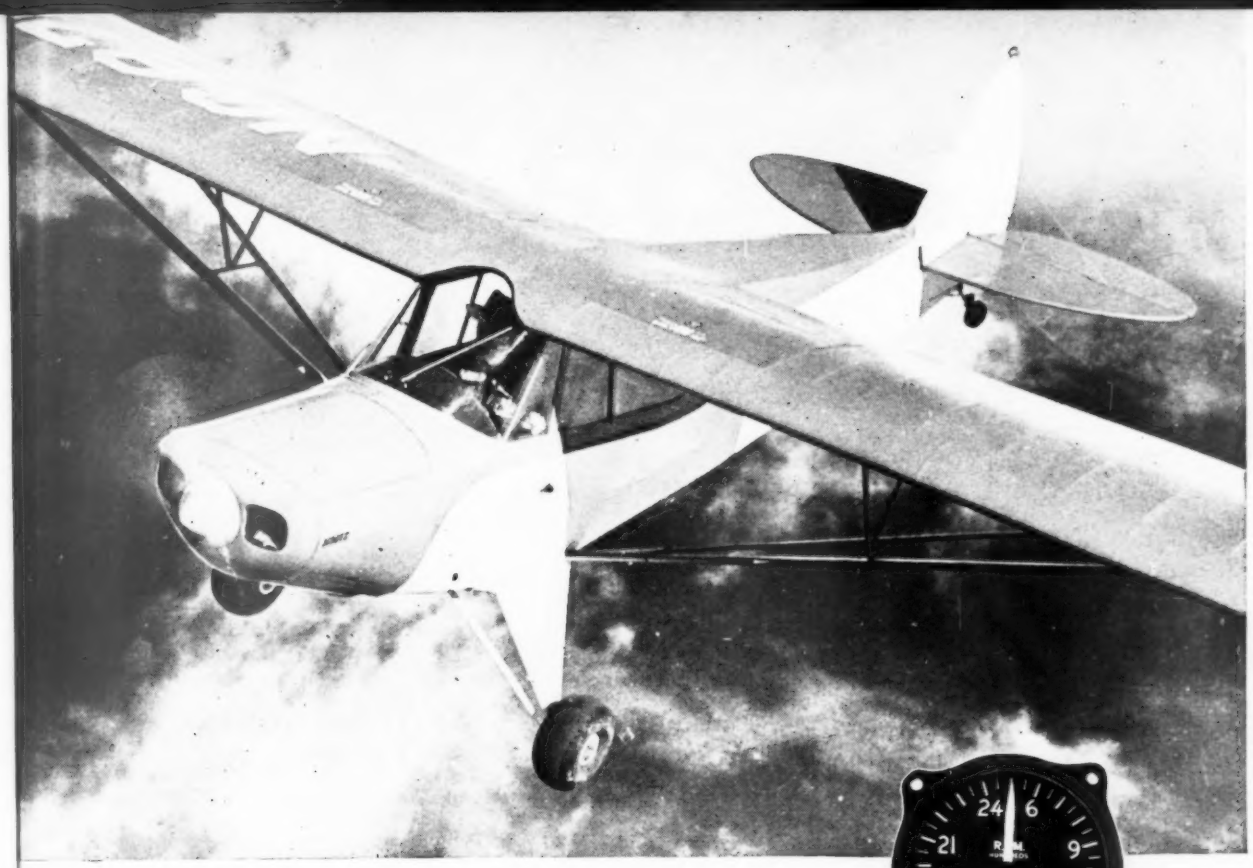
Cessna 140 is one of three models with cross-wind gear.



DC-3 tests indicate advantage for large transports.

Stinson Voyager now offers new gear as extra feature.

Aero Commander is new twin-engined executive plane powered with two Lycoming 190-h.p. engines. Craft can carry four to six passengers plus single pilot. It cruises at 165 m.p.h., has range fully loaded of 1,000 miles. Target price is $25,000. ATC is pending.



Using instruments properly, the pilot can save time, money—and grey hair. But he has to know some basic facts about operation and limitations of his gauges.

Get on to Your Gauges

Standard lightplane instruments can be the private pilot's best friend.

By JACK ANDRESEN

EARLY in flight training the obvious uses of each aircraft instrument usually are vaguely pointed out. "First turn at 400 feet, downwind leg at 500 feet, glide at 55, and don't let it rev over 2,200." That's okay for airport circling but when you get more than 25 miles from the roost, this business of navigation becomes more important.

A few instruments can help a lot if you know what you want the pointers to indicate—and then see to it that they do. Deciding what the instruments *should* read requires a rather intimate knowledge of the gadgets' operation and limitations. Let's examine a few familiar ones.

The altimeter is a pressure gauge which can find the altitude above sea level, provided you set the barometric pressure scale correctly. The convenient way to do this is to adjust the altimeter to read the airport altitude (not zero) before takeoff. On two- to four-hour trips, particularly in a cross wind direction on windy days, changes in this setting amounting to 500 to 1,000 feet may occur. Correct settings may be obtained en route from the radio weather reports or may be estimated from the weather map and forecast before takeoff. If you are *(Continued on page 54)*

Four basic instruments are required for accurate contact navigation. They are (from top) tachometer, compass, altimeter and air speed indicator.

JAP BAIT

The strange wartime saga of an ill-fated destroyer and a Marine pilot without a plane.

By J. DAVIS SCOTT

FIRST Lieut. Junie B. Lohan's strange story began at 1,000 feet over the Jap airfield on Tokuno Shima. He had raced in for a strafing attack when his *Corsair* was rocked by a terrific blast of flak. The instrument panel showed he was losing oil rapidly.

Lohan unbuckled his parachute harness and got out of it. He called his flight leader and told him he was going to ditch. Oil was covering his windshield, and Lohan wondered if he was making a mistake in not jumping—but it was too late now.

Looking down he could see the sea was exceptionally rough. If he hit wrong the waves might snap his plane in half. The spurting oil nearly blinded him. Then the engine stalled. Lohan levelled off as best he could. He landed hard but unhurt. Lucky.

Marine Lieutenant Lohan's adventure is one of hundreds of thousands which could be recalled on the third anniversary of victory in the Pacific. In Lohan's case it hardly begins with his successful ditching. He battled the seas. He was rescued by a destroyer. And only then did his real troubles commence. But let him tell it . . .

"I got out. Reached back for my boat pack. The straps had caught in the cockpit. I climbed back into the cockpit and tried to loosen it. The plane started to sink. I went down with it. I fought to get out of the cockpit under water. I had to drop the boat pack. I pulled the toggles on my Mae West and popped to the surface.

"The waves and swells were high. I took a beating. My shoes troubled me, so I took them off."

Looking up, Lohan could see the planes from his flight circling his position. They were within range of enemy ack-ack at Tokuno but they didn't seem to mind. Several of them dropped life rafts—realizing that without a raft Lohan was practically at the mercy of the sea. But Lohan found it impossible to swim to the rafts his mates dropped.

U.S.S. Colhoun steamed 40 miles through Jap-controlled waters to rescue Lieut. Junie Lohan, a Marine pilot shot down off Tokuno Shima. The destroyer was spotted by Kamikaze pilots who battered it for an entire day, damaging the ship so badly it had to be sunk by U. S. gunfire.

Lieut. Junie Lohan was shot down at sea, then fought on destroyer.

Flaming Kamikaze hurtles toward sea after being hit by flak in a Pacific battle. Lieutenant Lohan tells how bomb-carrying suicide pilot crashed into the U.S.S. Colhoun: "I figured he couldn't hit us. But he did . . . The ship shuddered, then plunged forward with all guns firing.

Suddenly his own chute and boatpack popped to the surface. It must have worked loose from the cockpit of the sunken plane. Lohan swam to it. He pulled out his jungle knife to cut it open.

"While selecting a place to cut I put the jungle knife in my mouth," he said. "A huge wave caught me and I went under. I lost the knife, boatpack and chute.

"I figured my situation wasn't hopeless but I guessed I'd better relax if I wanted to stay alive. Now the waves took me where they wanted. I floated on top, completely relaxed.

"Finally a plane dropped a rubber boat about 10 feet away. I swam to it, and climbed aboard. It was upside down but I didn't care.

"It wasn't long afterward that the mast of a destroyer appeared over the horizon. I cried with joy. They tossed a line, pulled me toward the ship. Two men lifted me over the side. I was half frozen."

Later, after a shower, a shot, some warming food and sleep he met the destroyer skipper and learned he was the sixth aviator the ship had rescued. The commander told him that his Wolfpack squadron mate, 2nd Lieut. R. B. Hamilton, had flown more than 40 miles from where Lohan went down to locate the destroyer and lead it to the rescue.

At 1:30 a.m. he finally got to his bunk. He had just closed his eyes when general quarters were sounded. Jap planes were attacking.

Lohan had fought Japs in the skies over Japan and Okinawa. He had shot down two. He hadn't been afraid. But this time it was different. He was a pilot without a plane. This was another side of the gruesome game called war.

"You feel like you're sitting in the middle of a huge gun turret with guns firing from all angles. The whole ship shudders as each barrage goes forth. In the rooms, light bulbs break. Glass splatters everywhere. Drawers come open, crash on the floor. The destroyer is a seaborne gun platform. The roar nearly deafens you.

"By morning the Japs were gone. The ship was unhit. No one knew exactly how many Jap pilots we'd shot out of the night skies—but it must have been plenty. I finally went to bed. In a short time I was up again. A husky ensign gave me some clothes and Doc Casey, the ship doctor, got me some bedroom slippers to wear. Seeing Doc again was an odd coincidence. He had treated me when I was a flying cadet back in Florida.

"By 4 o'clock that afternoon the Japs were back, and we were in the center of things again. *(Continued on page 46)*

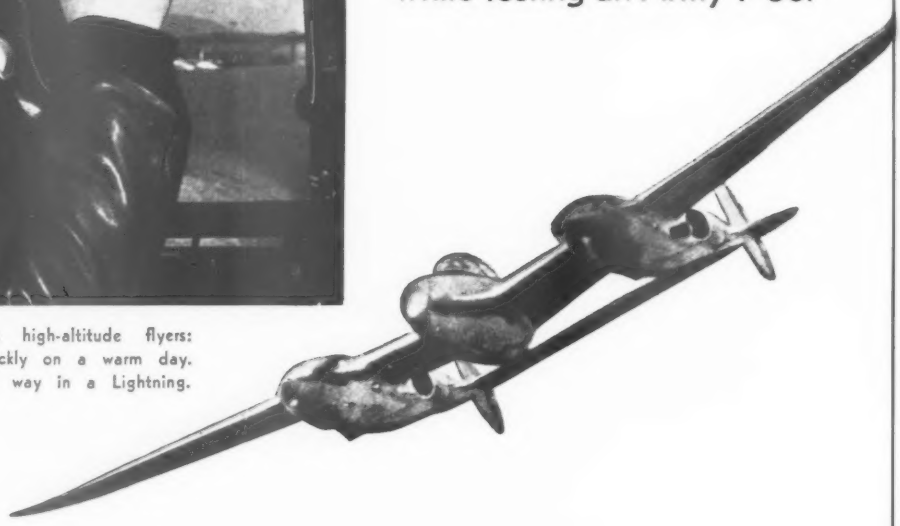
I Learned About Flying From That! NO. 104

Test Pilot Jim White warns high-altitude flyers: Don't fill oxygen tanks too quickly on a warm day. He learned his lesson the hard way in a Lightning.

By

JIM WHITE

Veteran Lockheed test pilot blacked-out at 35,000 feet while testing an Army P-38.



ON A FINE summer day in 1944 I took up a Lockheed P-38 on a test hop to 35,000 feet over Burbank, Calif. I didn't realize it at the time, but I was gathering some fine material for an "I Learned About Flying From That" episode which will always be pasted in my memory book. And I mean always.

I remember details of the afternoon very clearly. I had walked out on the hot field ready for the takeoff, only to be delayed while the ground crew filled my oxygen tanks. It was already midafternoon. I expected to be up some time, and in addition this was a "rush test." We were doing the final proving on an installation the Army wanted to put into combat immediately.

That was when I made my first mistake. I asked the boys on the ground crew to hurry it up.

I remember saying, "The faster you get that oxygen into the tanks the better I'll like it."

The crewmen took me at my word.

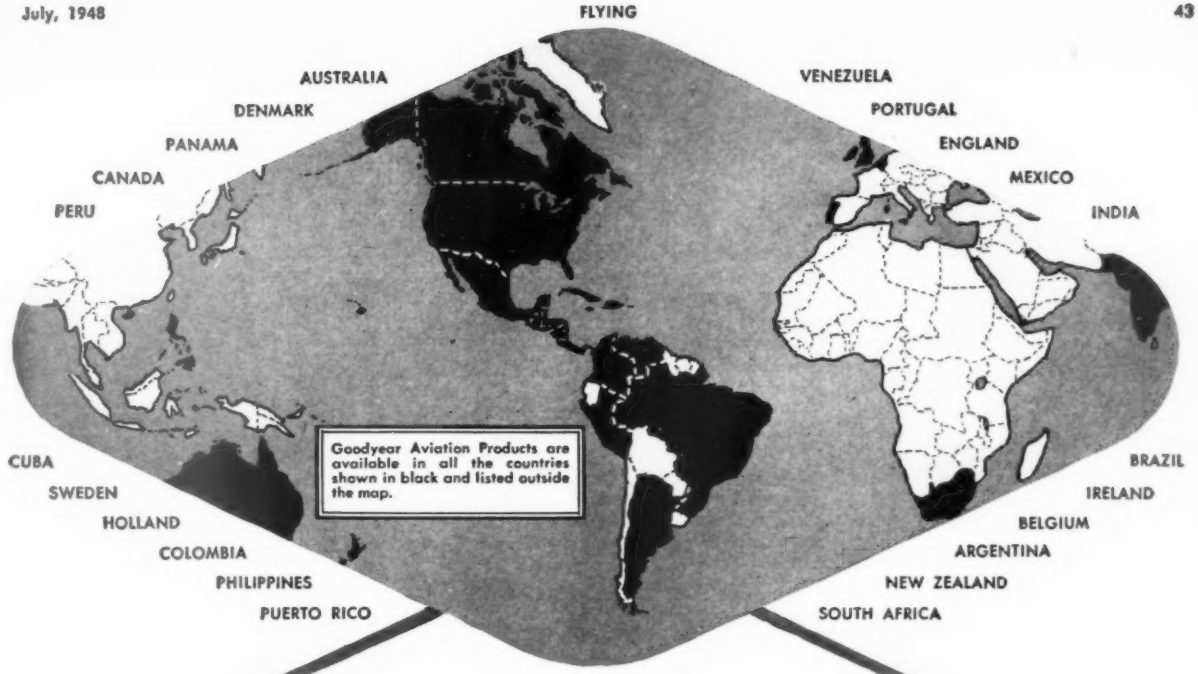
Of course I realize now that filling the warm tanks quickly --and under pressure--heats the oxygen to an unusually high degree, and when oxygen is heated, it expands.

You can guess what happened: My indicator showed the proper amount of tank pressure long before the minimum amount of oxygen required for the flight had been stored. How everyone on that plane overlooked this hazardous possibility I don't know. I'm not blaming anyone but myself, because the boys on the ground crew were working under my instructions. None of us had any idea of the near disaster it would cause me a few minutes later.

It was hot on the ground that day but was plenty cold at 35,000 feet. The oxygen in my tanks cooled rapidly, and contracted accordingly. The high pressure which the gauge had registered on the ground quickly dropped to zero.

I might have learned my lesson the easy way if I hadn't been so engrossed making out test reports. I would have noticed the tanks were emptying much too fast. And I would have headed for lower altitude immediately. But I was oblivious.

As every pilot knows, lack of oxygen is not noticeable immediately. The first reaction *(Continued on page 70)*



Goodyear Global Service

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GOODYEAR
AVIATION
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1898 50 GOODYEAR GOLDEN ANNIVERSARY 1948

MORE AIRCRAFT LAND ON GOODYEAR TIRES THAN ON ANY OTHER KIND

AOPA NEWS

Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is: "To make flying more useful, less expensive, safer and more fun."

Headquarters are: 15th and New York Aves., Washington 5, D. C. Members also receive a special AOPA edition of FLYING, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING MAGAZINE.

TWO recent surveys, the first conducted by the Aircraft Industries Association's Personal Aircraft Council and the second by *Esquire's* Market Research Department, give a down-to-earth picture of private flying today and substantiate the need for the work AOPA is doing.

AIA's "Planes at Work" is a users' survey summary compiled from 100 replies to a questionnaire distributed among large and small companies and manufacturers. *Esquire's* survey is a plane ownership study conducted in Pennsylvania—selected as a typical state because it is part urban, part rural and contains all sizes of cities.

Both surveys asked the owner and pilot what he believed was private flying's biggest problem and disadvantage. Industrial users complained of:

(1) Airport facilities and services in general (43 per cent).

(2) Adverse weather conditions, which hinder full plane utility (32 per cent).

(3) Lack of ground transportation (24 per cent).

(4) Lack of airports and hangars and poor location of existing airports.

Eighty-eight per cent of the private owners and pilots named cost as their biggest hurdle, with lack of airports, landing strips, XC markings, ground transportation and airport facilities running a close second.

Corrective suggestions offered by respondents closely parallel AOPA's program. Better ground transportation, close-in airparks and flight strips, increased airmarking, flat rate repair service, increased night flying facilities and standardization of field rules were all named. AIA's survey showed that the overall consumer cry is "Show a little interest in the guy who pays the bill."

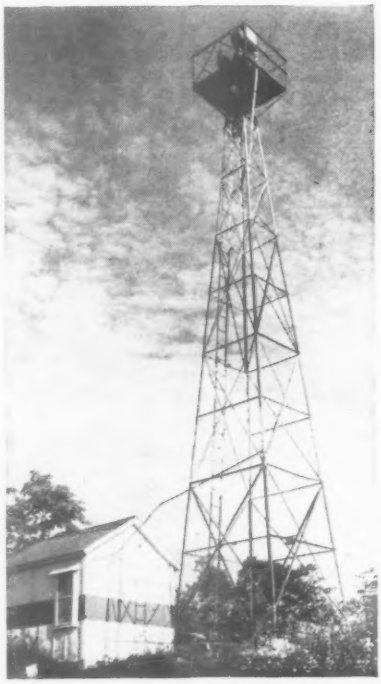
Esquire's survey indicates that the average aircraft owner is 38 years old, married and has an annual income of $6,065. He bought a used plane, flies it an average of 30 hours a month and figures it costs him roughly $706 a year to maintain and fly. An occupational breakdown of owners show 15.7 per cent are major executives, 23 per cent are owners of business and 14 per cent are skilled labor.

A bearings distributor, answering AIA's survey, stated, "Having our own plane has added prestige and created interest among our customers." A theater chain reported, "Can't operate without it!" and a petroleum products company wrote, "Without plane, would need several additional men to cover the same territory."

Pilot Fly-ins

AOPA's San Francisco Peninsula Unit is sponsoring monthly "Pilot Fly-Ins" to bring within "hand-shaking" distance as many licensed pilots as possible at least once each month, and to provide a means of quick distribution of aviation information to licensed pilots in Northern California.

Rox Penlon, AOPA member 17113 and unit chairman, states, "This is an attempt to organize a flying activity which is not subject to cancellation because of bad weather, and to eliminate the headaches which generally go with highly-organized 'breakfast flights.' It is an attempt to give purpose to the occasional flight of the licensed pilot who is forced to rent a plane. In the interest of the operator, time spent at the meeting place will be cut to a minimum.



Rotating airways beacons should be retained for private pilot use, AOPA says.

We want all operators to encourage pilots to rent planes for these monthly 'Fly-Ins'."

Each month a different airport is selected for the meeting place and a local flight operator provides prizes for a spot landing contest. After all participants have registered, announcements of importance to private flyers are made, the next Fly-In location is chosen and cash prizes are awarded in a drawing of AOPA registration numbers.

AOPA Objects

For many months AOPA has objected to certain ICAO (International Civil Aviation Organization) regulations because they would place stumbling blocks in the path of private aviation.

AOPA's fears were realized last month when the Air Coordinating Committee officially announced: "The ACC will now coordinate action by Federal agencies looking toward giving the [ICAO] standards effect in this country."

AOPA has again asked ACC to answer the following questions published in the January 1947 *AOPA Pilot:* Will pilots, to seek domestic relief from regulations, have to argue their points before an international tribunal? Will pilots flying within the U. S. be restricted by regulations made for international air transport travel? What powers of the Civil Aeronautics Board are to be usurped? Will aviation industry groups be able to help promulgate regulations?

Rotating Beacons

AOPA officials recently registered an objection with the Congressional Aviation Policy Board regarding the Board's recommendation that rotating airway beacons be gradually eliminated.

J. B. Hartranft, Jr., AOPA general manager, stated, "Although a large portion of the Congressional report dealt with the national defense aspect of civil aviation there were portions directly concerning the private flyer, and the matter of rotating airway beacons falls into this category. We believe a serious error has been made in this instance. There has been no question at any time with respect to the rotating beacon's value to the private pilot."

In this connection, Hartranft quoted a letter from AOPA member James D. Swan, who stated, "When a radio failure occurs our light-lines of rotating beacons become life-lines. Such a radio failure occurred to me recently and without the light-lines for reference I would likely have become another statistic."

Minnesota Airmarking

The State of Minnesota plans to install approximately 120 airmarkers in smaller municipalities by July 15. The markers will conform to CAA specifications except for designations of latitude and longitude. They will be installed only in communities which cannot be recognized easily from the air. Longitudinal and latitudinal markers will be added if CAA funds are made available for the purpose.

The Minnesota Department of Aeronautics followed the lead of North and South Dakota in requesting assistance of grain elevator companies in painting identification signs on the sides of elevators.

Detroit Aviation Clinic

The sixth annual National Aviation Clinic will be held in Detroit on October 17-21, with Governor Kim Sigler of Michigan serving as one of the co-chairmen. Co-hosts at the clinic will be the Aero Club of Michigan and the Michigan State Department of Aeronautics.

END

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THE NAME MEN FLY BY

Jap Bait

(Continued from page 41)

Fifteen minutes later another destroyer radioed for help. We put on full steam. Found her in bad shape. We made high speed turns about her and then the Japs turned their fury on us.

"We opened up. One of the Jap planes was hit. It trailed white smoke. Evidently the oil line had been smashed. It pulled out of its dive before we could inflict more damage.

"Jap planes were everywhere, and one started to dive on us. He came in at about 300 m.p.h. and it didn't take more than a glance to realize that this guy was a suicide pilot. He was going to bring his bomb right to us—deliver it personally, giving up his life for a hit. Our gunners swung on him. Everyone else ducked for cover.

"Too fascinated to move an inch, I just stood by the rail and watched him come racing toward us. I wasn't afraid. Guess I wanted to see what another pilot was going to do. I reckon I figured he couldn't hit us. But he did. He hit with a terrific whack forward of amidships. Parts of the airplane went everywhere. It tore up the deck, kindled fires.

"I don't believe I'll ever forget the noise that plane made as it came racing in. It was a horrible sound. Something like when a plane flathats a house. But instead of trailing away in the distance, it ended with a sudden, startling splat!

"Doc Casey and I had just begun to carry the worst cases into the wardroom for treatment when another suicide plane hit us. The ship shuddered, then plunged forward, all guns still firing.

"The wounded were suffering terribly. Many were badly burned. But time and again a sailor would refuse treatment, waving us to others more badly burned. We gave morphine to the worst cases.

"Another Jap came diving at us. Evidently he was of the suicide corps, too—but he missed. His plane went in alongside with a big splash. The force of the crash sent the plane's belly tank flying through the air. It landed amidships, smashed, and sent flames racing to all corners of the ship."

Lohan, working with Doc Casey and a host of volunteers, raced from side to side picking up the wounded, carrying them to safe spots—giving them relief with morphine and burn ointment.

The deck was wet and slippery. His bedroom slippers were soaked through. Suddenly he realized that his feet were wet and cold.

"Damn it," he said aloud. "If I don't get out of these wet slippers I'll be catching pneumonia."

He never got time to change. The word was passed that another enemy plane was diving on the ship—this time from the starboard.

"We crouched with the wounded—and prayed," Lohan recalls. "The plane hit directly amidships. The bomb he was carrying burst on impact and there was death and destruction everywhere. Our ship was stopped dead in the water.

"The fire rooms were the hardest hit. Only one man emerged alive from each one. You could see the horribly burned bodies floating in the blackened water. It was terrible. Awful. I gave blood plasma. The doc was everywhere.

"The explosion blew one sailor overboard. He started to drift away. Another sailor dove in after him. Someone tossed him a line and he carried it to the half-drowned first man. We pulled them back aboard.

"The noise, the diving planes, the barrages, the moans of the dying, the cries of the wounded and the burned jarred your senses, upset your mind.

"I saw one sailor shaking like a leaf. He was so frightened he was unable to move out of danger. A couple of minutes later I saw the same sailor carrying wounded, helping the doctor and doing the work

FLYING

of three men. He was the coolest man aboard.

"I went topside to help with the burn cases and learned that our guns were firing only manually. Our electrical system had been knocked out.

"They asked me to help spot enemy planes. The Japs were making us a special target. They figured we were goners. I could count more than 15 enemy planes above us. Our planes were giving them hell but every now and then one would slip through and come diving at us.

"One Jap slipped up astern. He missed hitting us directly but his wing caught on the fantail and he flipped over and went down. New fires sprung up.

"After that it was just plain hell. I thought about my wet feet, though. Thought surely I was going to catch cold. Funny how little things like that keep buzzing through your head.

"There were *Corsairs* and *Hellcats* above us—fighting the Japs. A *Val* peeled off behind them and came in without being touched. It dropped a 500-pound bomb opposite the No. 1 turret on the portside. I hit the deck. The concussion jarred the ship from stem to stern.

"We figured we were about done for now. We got the rafts together and lashed them with rope. We wanted to be together—we wanted to be sure the stretcher cases, they were multiplying now, were going to be able to go along with us.

"I went back to the bridge. Another suicide-mad Jap came boring in. He was aiming for the bridge. Coming like hell. I figured this one had my number. I crouched behind the bulkhead, all unnerved. He hit the portside of the bridge, the fuselage smashed all over the superstructure—but for some reason the bomb didn't go off. It fell into the water alongside.

"I stood up and looked over the side. I could see the dead Jap pilot floating by us. He was dressed in some kind of a silken robe. It had a big anchor embroidered on it. He didn't look a day over 14 years old."

The order was passed to prepare to abandon ship.

"I prayed and prayed. No real prayers. I just asked for God's help. Asked Him to bless us all."

By 9 o'clock another destroyer had answered the ship's plea for help. The fires lit up the darkness. When the destroyer tried to come alongside to take off personnel the seas were found to be too rough. It gave up.

"Finally a couple of LCS's came alongside. We put over the stretcher cases, the badly wounded first—then the rest. Some went over head first. The skipper, first lieutenant, gunnery officer and several others stayed aboard to keep the ship afloat as long as they could. The LCS headed for the nearest U. S. base.

"That ride was a nightmare. There were still plenty of Jap planes around. And we knew that if just one singled us out and dove for us—well, everyone would be killed.

"It took hours. We couldn't turn. The LCS skipper was afraid a turn might capsize the ship. We prayed silently. We prayed aloud.

"I tried to sleep sitting down—but sleep wouldn't come. I kept seeing the Japs diving at us. I kept remembering the courage of the kids whose burned bodies we'd left behind.

"Then out of the dawn came the shape of a ship. Then another. And another. Up ahead. We realized we were nearing our fleet base. I broke down and cried. I looked around. Lots of others were crying, too."

Bitter news waited their arrival. Their ship had finally been abandoned—and sunk by our own gunfire. The two men Doc Casey had heroically saved from the fire rooms had died during the night aboard the LCS.

When Lohan finally returned to his carrier, his Marine squadron mates gathered around and wanted to hear the story of his experiences.

"I'll tell it just once. That once will be to Scotty. If it ever gets into print you can all read it. After I tell Scotty I'm not going to talk about it. I'm going to forget it as soon as I can.

"But there's one thing I won't forget. I don't want any of you guys to forget it either. That's the courage of the men on those destroyers. We owe a lot to them. More than any of us can ever repay." END

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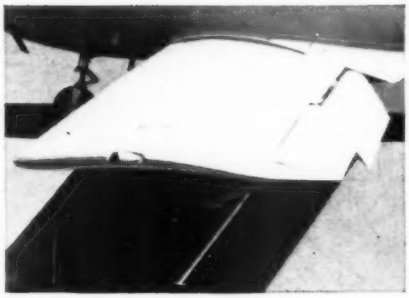

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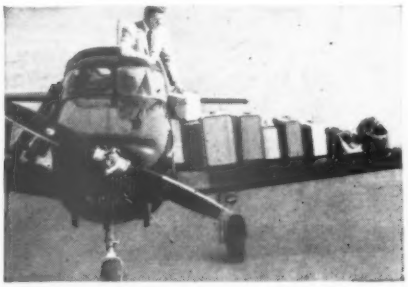
3 FULL-VISION CABIN. Here's visibility designed for Sunday traffic. Seven large, clear windows let you see in every direction. No blind spots while flying or taxiing. You can even use a rear-view mirror...see 12° down over *Navion* nose.



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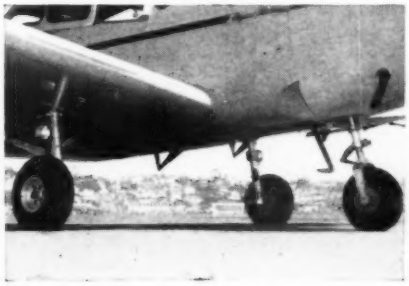

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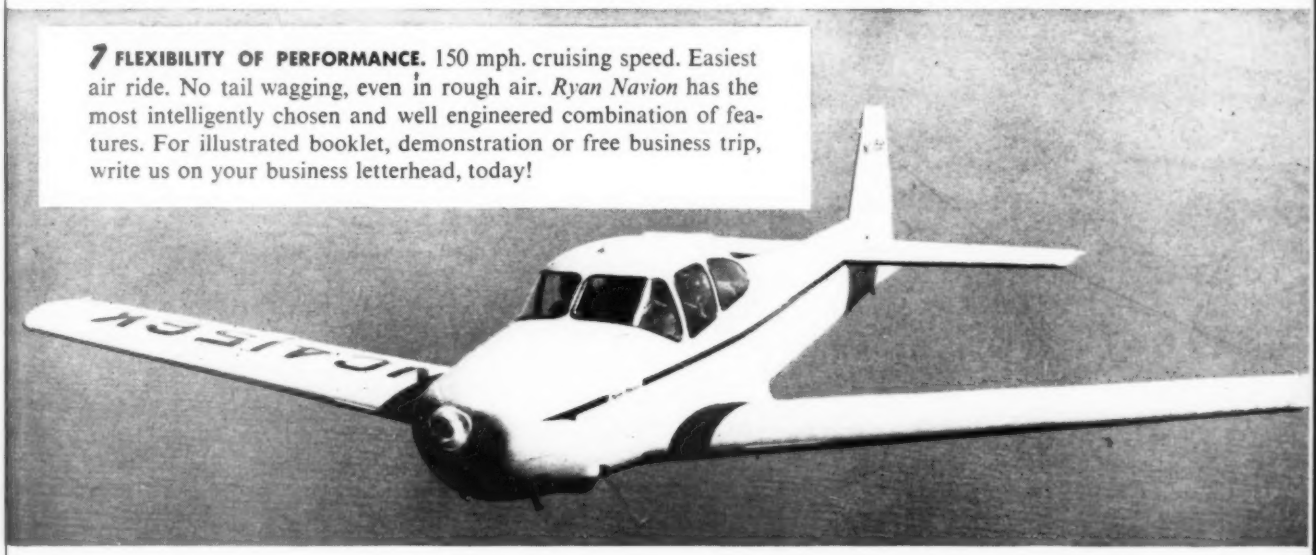
7 FLEXIBILITY OF PERFORMANCE. 150 mph. cruising speed. Easiest air ride. No tail wagging, even in rough air. *Ryan Navion* has the most intelligently chosen and well engineered combination of features. For illustrated booklet, demonstration or free business trip, write us on your business letterhead, today!



The Thoroughly Proven Post-War Plane *Ryan Navion*

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Surplus Planes-a Bargain?

(Continued from page 25)

and $40 (engine) for a 100-hour inspection. And in smaller shops, prices are correspondingly higher.

That's not the sum of this flyer's financial woes. Just gas and oil for a 450-h.p. engine average $6 per hour for two persons. A few owners, of course, have invested $395 for a three-passenger kit to install in the rear cockpit. The list is long—propeller overhaul is $35 to $60, tires can be bought surplus for $5 and new for $30, leaky gas tanks (a BT specialty) can be superficially plugged with anti-leak compound for $10 or the owner can pay $300 to have a wing removed and the tank fixed. The 18 spark plugs cost from $1 to $3 each, depending on where they are purchased.

The story on PTs doesn't sound brighter. Many Fairchild PT-19s were tied down in the sun and rain of southern states for two years. Now, owned by bargain-hunters, many of these planes are condemned because of dry rot in wing panels. Extra panels and center sections are almost impossible to find. And when they're found, the owner then has to face the maintenance problem again. Overhauls on Ranger 175-h.p. engines will average $1,200 to $1,400. Continental 220s will cost $800 to $1,500 for a major.

The same high cost range holds true—to greater or less degree—for many of the remaining approximately 3,775 liaison types, 900 utility cargo planes, 2,900 light, 1,300 medium, and 450 heavy transports; and 11,915 primary, 8,670 basic and 4,775 advanced trainers sold by WAA. The Government paid more than $5,000,000,000 for these aircraft (plus some 30,000 strictly tactical types which were salvaged or scrapped). But their utility to private owners cannot be measured by the yardstick of original cost.

Most successful in using the surplus planes are business operations which can stand high maintenance and operating costs in return for increased performance. Sally Chapin, chief pilot for an eastern company which has a fleet of AT-6s for executive transportation, points out that surplus aircraft do a good job but that a drawback is "operational and maintenance costs and the trouble finding parts." Her organization has five AT-6s. She says, "I have been running the maintenance and conversion of all planes for two years—and we are well pleased. We've had a minimum of trouble. However, you have to learn your way around the surplus game, which is hard for the private owner. After eternally padded bills from repair stations, we finally gave up and hired a mechanic."

She adds: "Naturally, maintenance is high on replacement parts unless they can be bought surplus, which usually means you have to know the ropes in order to get anything accomplished." Her company has recently purchased a *Bonanza*, which is proving highly efficient.

Many operators are disappointed in the surplus craft, even for use in advanced flight training. One operator told FLYING he picked up a PT-17 for $875 and spent $600 to convert it only to find that CAA requirements had been considerably relaxed after the job was completed. Because he couldn't get insurance, and because his airfield was small, he had to be extremely cautious in allowing pilots to fly it—and he got little use out of the plane. When a major overhaul job loomed up, he sold the plane rather than invest more money in it.

Henry Delo of Tappen, N.Y., finds himself in somewhat the same spot. A former P-51 pilot, he bought a surplus BT-13, but before he was able to get it in the air he had to dole out $150 for essential repairs. Back home in New York, he discovered he'd have to spend $400 to $500 to get the plane licensed. So he stored it. Last fall he hired a mechanic to convert the plane. The mechanic finally had to re-wire the entire craft with his own wiring scheme because the model is obsolete and the manufacturer could give no information on the wiring installation.

However, high cost of operation is the chief complaint of surplus plane owners. One BT-13 buyer claims he uses more than 30 gallons of gas an hour. Another, with a PT-23, averages 18 to 20 gallons of gas and two to three quarts of oil an hour. Even a PT-19 uses 15 gallons, its owner reported to FLYING.

Take the case of Gloria Heath, who has an AT-6 at Westchester County Airport, N. Y. No aviation knocker, the ex-WASP is currently writing a book on the advantages of private flying. But she admits that her carefully-kept records show it cost $1,500 to fly her AT-6 50 hours last year. That's an operating cost of about $30 per hour. High octane gas and heavy oil consumption ran about $10 an hour; repair and maintenance added another $10 per hour, and Gloria felt lucky to keep the bills that low. Good mechanics charged $12.50 per day for work on Army planes and the AT-6 required constant checkups to keep in top flying condition. She also felt lucky to get liability and hull insurance (most companies are leery of issuing crash insurance on surplus aircraft, on which a minor repair bill can exceed original cost). Her general overhead expenses, including the insurance, accounted for the remaining $10 per hour.

W. H. "Hank" Coffin, manager of Vail Field in Los Angeles, offers substantiating testimony. "You can fly as a fare-paying passenger on an airliner cheaper than you can operate your own BT. We figure it costs us $12.50 per hour just to keep our BTs in the air, and that's not counting depreciation. We're replacing them as fast as possible with new lightplanes." Operators estimate the cost of a twin-engined Cessna, including proper maintenance, at $35 per hour.

The average flyer has other complaints which he didn't figure when buying his plane: basic and advanced trainers can't be flown safely from just any port. Even expert CAA pilots often prefer lighter planes because of the danger of operating the military trainers from strange fields. Some airport operators don't like to have surplus planes on their fields because they're too often used for illegal stunting, which endangers the operator's reputation in the community.

From most available evidence it seems the majority of private pilots who bought surplus planes would have been better satisfied had they invested in a lighter, less-expensive airplane. They find themselves now with heavy planes, difficult to maintain and highly expensive to operate.

The situation is particularly important because approximately one-third of all registered aircraft are from surplus stocks and encounter these problems.

Most private pilots have found their "bargain" is too costly for minor business chores or for routine pleasure flights. More and more they are leaving the surplus jobs to business outfits which can afford to maintain them. END

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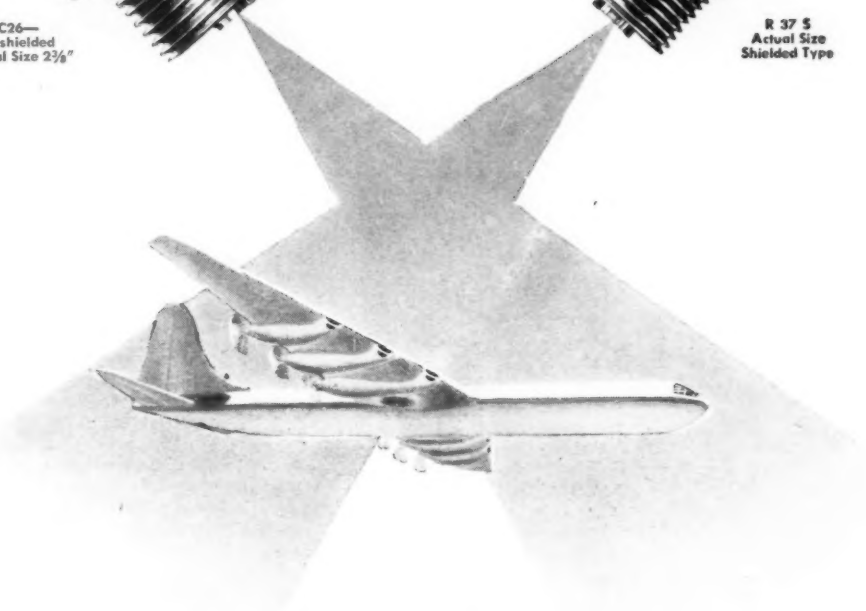

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The On-Time Airline

(Continued from page 30)

black, impossible to see through the windshield, though the cockpit remained clearly illuminated. This is the simulated blind-flying setup used on all flights of the All Weather Air Line. Captain Spradley would wear blue glasses right up to touch-down, completing the entire flight on instruments. Captain McCleary did not wear them. As safety pilot his job was to check Spradley.

Within five minutes from take-off, Captain Spradley had turned onto our course and we were headed for Washington along the invisible airway. All flights of the All Weather Line are made by dead reckoning but the plane is under constant radar surveillance over virtually its entire route.

We climbed steadily to our assigned 7,000-foot altitude. It was a clear day and visibility was better than 10 miles for everyone but our blind-flying pilot. There were scattered cirrus clouds high overhead and we met a temperature inversion as we climbed. It was −15° C. on the ground, but got warmer as we gained altitude. At 7,000 feet it was only −2°. We were cruising at 1,900 r.p.m.'s at 28 inches of mercury. We hit our first major check point, south of Parkersburg, W. Va., one minute late at 9:36 a.m. Twenty-five minutes later we were exactly on time over Elkins radio range at 10:01 a.m., and over our next check point 10 miles south of Petersburg at 10:12 a.m. Our drift meter showed a reading of plus 1° at 10:08 —exactly in line with Navigator Tucker's forecast.

Captain Spradley had the benefit of complete blind-flying instrumentation, including a pressure altimeter, radio altimeter, airspeed, bank and turn, and rate of climb indicators, and a battery of compasses: Gyrosyn, magnetic, flux gate, and radio. He also had a directional gyro, artificial horizon, and radar position equipment.

For low approach to a landing he had a SCS-51 indicator, Sperry microwave indicator, and an A-12 autopilot which is used with Sperry microwave. The autopilot will fly the plane down to within 10 feet of the runway automatically, but at that altitude it must be switched off because microwave does not yet have a flare-out built into it. On this flight we wouldn't use either SCS-51 or microwave, but would come in on GCA, a radar system which doesn't need any specific cockpit equipment except a radio for instruction to the pilot.

The new radars and radar traffic control methods used on the All Weather Air Line, like the line itself, are experimental. But they point the way to a time when all the airlines—military and civilian—will be flying regularly and dependably in all conditions of weather. They are essentially working toward a system of complete radar surveillance of the airway, with the planes under control at all times. The airway radar, in turn, is capable of turning the planes over to airport traffic control for landing—either by the GCA radar method or by the beam systems used by SCS-51 and Sperry microwave.

At the Wilmington end of the airway is a surveillance radar set with a rotating antenna which has a very long range. There is also a short range radar designed as an airplane traffic control system to feed aircraft into the GCA landing system. At the Washington end of the airway, there is another long range surveillance radar which serves a double function of surveying airway traffic and turning the planes over to airplane traffic control. Three hundred forty miles of the airline distance of 375 miles is continually under radar surveillance.

All traffic over the route can be watched on the radar scopes, distances gauged, and aircraft directed by radio communications. Here is the beginning of a whole new concept of air traffic control.

Everything was going smoothly during our flight. Our radioman was T/Sgt. R. F. Isitt. The engineer, S/Sgt. G. B. Rheinscheld, sat on the jump seat watching the engine gauges and recording his engine log and gas consumption. On the trip back from Andrews Field, their places were taken by M/Sgt. F. H. Rechlin and M/Sgt. C. W. Burley. Every flight of the All Weather Air Line is a training flight.

Captain Spradley was taking it easy, going through his routine with the sure know-how of an Air Force green ticket pilot. Spradley's home is in Troy, Ala. He is a tall slender man with deep-set eyes. He was graduated from flying school on August 5, 1942, and flew A-20s and B-17s in North Africa and Italy, where he was credited with 52½ missions. In February, 1946, he started to fly transport planes and took to it at once. Like other pilots on the All Weather Air Line, Spradley has had to go through a rigorous special training course.

Fifteen pilots and co-pilots have flown the All Weather Air Line since it started. They are required to have 2,000 hours of flying time before they are eligible for training. Training includes 30 hours of advanced meteorology, 30 hours of engineering, 30 hours of navigation, 12 hours of CAA rules and regulations, five hours of theory and instruments, eight hours of radio, 35 hours of synthetic training, and 100 hours of transition flight training. Similar advanced courses are required for all navigators, flight engineers and radio operators.

Standard Air Force operating minimums call for 800-foot ceilings and one-mile visibility for landing. When ceilings are less than 800 feet, visibility must be at least two miles. These minimums may be cut in half with GCA landings.

With the All Weather Air Line, however, pilots like Spradley have completed 25 flights with ceilings below 300 feet, and 31 flights with visibility less than one mile. Thirteen flights have been completed with less than 100-foot ceilings and one-half-mile visibility. Mostly C-54s are flown, but there are some C-47s and B-17s. Automatic approach equipment is installed in some of the planes, in which the autopilot is coupled with Sperry microwave or SCS-51 (standard CAA ILS), and completely automatic landings have been made. In over 1½ years, no flights have been cancelled because of bad weather.

The "new look" in airlines is best exemplified, perhaps, by our landing at Andrews Field. Our approach really began 38 minutes—and more than 120 miles—out from the field. At 10:22, the surveillance radar at Washington National picked us up on their scopes while we were 23 miles southwest of Front Royal. Radioman Isitt turned on the B-4 beacon code which identified us in the radar scope and they instructed us to land by GCA on Runway 19. Two minutes later we were over our check point 24 miles south of Front Royal only one minute behind schedule.

At 10:30, Captain Spradley started his descent 36 miles west of Quantico. We descended at the rate of 300 feet per minute to 3,000 feet. At 10:33 surveillance radar gave us a 10° correction to 120°. We were directly over the Quantico Range Station at 10:30 a.m.—still one minute behind schedule. We crossed the southwest leg of the Washington range at right angles at 10:42 a.m. and one minute later surveillance radar turned us over to air traffic control for initial approach. Then Andrews Field GCA took us over for final approach.

"Hello, All Weather II, this is Andrews GCA," the GCA controller advised.

"Hello, Andrews Field GCA, this is All Weather II, receive you five by five."

Record Breaker

JOHN Cunningham, chief test pilot of the DeHavilland Aircraft Company, recently set a new world's altitude record of 59,492 feet in a Vampire jet fighter. His mark bettered by 3,447 feet the previous record of 56,045 feet established October 22, 1938, by Lieut. Col. Mario Pezzi in a Caproni biplane.

Cunningham took off March 23 in the special pressurized version of the RAF fighter. The craft had an increased wing span and was equipped with a special *Ghost* jet engine.

At 60,000 feet the pressure in the cabin was equal to that at 37,000 feet. Although the temperature outside the airplane was about 68° below zero, the cabin interior was heated to about 60°.

The entire flight to 11 miles above the earth, from take-off to landing, took only 47 minutes. A large part of this time was spent struggling for the last few feet.

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He learned to fly at the Wright Brothers' Flying School in Dayton, O. . . .

Most persons don't know he was first to take off and land on gauges . . .

It was a cold day in May when this gentleman did an "impossible" job . . .

Bendix Trophy winner in 1937, records fell fast when she appeared . . .

Left to right: Howard Hughes, James H. Doolittle, (Gen. "Hap" Arnold, Richard E. Byrd, Jacqueline Cochran.

"Hello, All Weather II, there will be no need for further transmission. Your gear and flaps should be down and locked. You are six and one-half miles from touchdown. You are on a heading of 190°. You are six miles from touchdown . . . You are lining up well . . ." came the reassuring voice of the ground controller.

"You are to the left of the runway . . . Steer right seven degrees to a heading of 197. . . . You are now entering the glide path. . . . Begin your descent at 500 feet per minute. . . . You are five miles from touchdown. Now steer left two degrees to a heading of 195 degrees. . . . Now steer left three degrees to a heading of 192 degrees. . . . You are still going off to the right. . . . Steer left three degrees to a heading of 189 degrees. . . . You are coming in fine now. Steer right to a heading of 190 degrees. One ninety is your heading." The ground controller was talking continually.

"You are now three miles from touchdown. . . . You are two and one-half miles from touchdown. . . . One ninety is your heading. You are two miles from touchdown. . . . Steer left to a heading of 188 degrees. One eighty-eight is your new heading. . . . You are 50 feet high on the glide path. . . . Increase your rate of descent slightly. . . . Steer further left to a heading of 186 degrees. . . . You are lining up well. . . . You are over the end of the runway. . . . You are down the middle of the runway. . . . Take over visually and land!"

Captain Spradley tore off his blue goggles at 50 feet and set the big plane down gently. "Down at 10:59," was his only comment. He had made a difficult landing with a gusty cross tail wind. We taxied up to the Andrews Field hangar and deplaned. My feet were warm now. . . .

If the commercial air lines now operated with the dependability of the All Weather Air Line, their current deficits would be transformed into healthy profits!

This is not an irresponsible statement. The Congressional Aviation Policy Board recently estimated that the commercial airlines, operating about 1,000 planes, lose about $40,000,000 annually due to air traffic congestion delays, flight cancellations and schedule unreliability.

"If the air traffic control system remains essentially unchanged," says the Board, "the loss that could be expected during the next 15 years would amount to more than $600,000,000. . . . Substantial increase in the use of airways by the air transport industry, without even considering military use, would be hazardous with today's inadequate aids, especially in view of higher speeds."

Only 46 per cent of airline schedules today are on-time. If the new techniques, such as are used by the All Weather Air Line, were installed on all airways today, on-time schedules would rise to an estimated 95 per cent. "Instead of being saturated by 1,000 airplanes, it is estimated that the airways could absorb 5,000 transport aircraft in the predictable future with assurance and safety, even at major air terminals."

It is plain from this that the new traffic control devices proposed by such agencies as the Radio Technical Commission for Aeronautics, some of which are being tested by the Air Force All Weather Flying Center, together with low-visibility flying techniques being worked out by the latter, will bring a new era in airline safety, dependability and profits.

It is equally plain, however, that these new devices and techniques are not yet ready for the commercial airlines.

Col. James M. Gillespie, chief of the All Weather Flying Division, wants no misunderstanding on this point. "With high intensity lights, with low approach devices, and radar surveillance, we have a satisfactory military system where we must take a small calculated risk," he says.

"What we are operating is definitely an experiment. I think that time will permit this operation to be called safe, but I don't believe it has been tried out enough, and we know ways we can improve it.

"We've had to do some things that I would question with a planeload of passengers—at least commercially. For instance, we once landed at Andrews Field on a snow-covered runway with a ceiling of about 50 feet. That is the worst possible condition and we had to make four or five runs before we finally got down. It was a GCA landing, by the way."

Col. J. Francis Taylor, Jr., of the All Weather Flying Center, points out some of the ways he believes the system can be improved. "On automatic landings, for instance, the plane actually flies below the glide path and it lands awfully hard."

To Colonel Taylor, a landing system is one that will "not only permit us to touch down safely but to complete our roll. By such standards we have no landing system at present."

Colonel Taylor feels that both GCA and SCS-51 (the CAA's instrument landing system) or Sperry Micro-Wave should be used by All Weather airplanes. Without exploring the merits of the three, he points out that one helps safeguard the other. Both systems are necessary, he feels, and "as long as we have two systems we intend to use both."

Col. Algene Key, director of the All Weather Air Line, points out that his pilots are trained exclusively for that particular type of flying. Their training is far different from that received by airline pilots. "There's a lot of difference between flying instruments all the time or just occasionally."

All his airline's flying is blind from take-off down to landing. "We must fly this way every day. If we don't, we get in a snarl. Commercial pilots, on the other hand, seldom fly instruments when it really pays off—in take-off and landing at low minimums."

The long-time aim of the All Weather Air Line, however, is to help develop flying techniques and an air traffic control setup which can be applied all over the United States some day. When that happens, the airlines will be busier and considerably more trouble-free than they are now, and that bane of instrument weather—the landing approach stack—will be abolished forever. END

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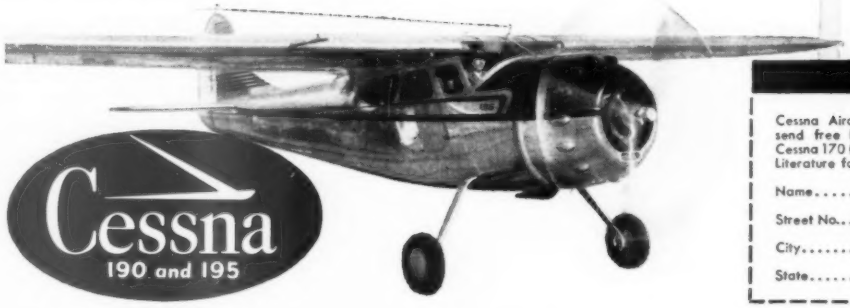

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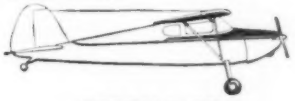

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Get On To Your Gauges

(Continued from page 39)

expecting to land at a place of higher barometric pressure, your actual altitude will be higher than indicated by about 30 feet for each millibar change. The reverse is true when you fly into a lower pressure zone.

To hold a level flight path glance frequently at the altimeter and correct with elevators any tendency to climb or dive before it gets too great. A level course is most economical in gas as well as time. You don't gain as much in the glide as you lose in the climb.

Assuming you want to maintain a certain true air speed or ground speed, you will get better mileage at 10,000 feet than on the ground. Up there you are pushing the wheels and fuselage through much thinner air. Just how high you should cruise depends upon the length of the trip. Unless wind or cloud conditions indicate otherwise, figure you can spend up to 1/6 of the time climbing, 1/6 descending and the rest at altitude.

The Airspeed Indicator interprets in miles per hour the force you feel if you hold your hand out in the airstream. This pressure gauge gets its information from a pipe (pitot tube) sticking forward into the airstream and from the ambient atmospheric or "static" pressure. Its readings must be taken with a grain of salt, however, for they are somewhat biased by a number of factors:

First, it rarely gives you the true speed through the air. Markings on the dial are based on the so-called "standard atmosphere" which represents average sea-level barometric pressure of 29.92 inches of mercury and a temperature of 59°. For other pressures and temperatures the reading may be corrected approximately by adding 2 per cent for each thousand feet of altitude and allowing 1 per cent extra for each 10° above "standard" temperature. The circular, slide-rule type computors, which also are handy for time-rate-distance calculations, have a pair of scales which apply the necessary corrections simply and accurately.

For an entirely different reason the stall warning mark on the airspeed indicator should be eyed with suspicion. Changes from the airplane's normal load, whether in the form of an extra passenger or G load in a turn or pull-out, will increase the stalling speed. This increase is in proportion to the square root of the gross load times the G load. If the normal stall is, say 42 m.p.h., then in a 60° banked turn the load of two G's will bring the stall up to 61 m.p.h.

Due largely to wrong placement or lack of a suitable static pressure source, many planes have what is known as "position error" for the airspeed indicator. Correction for position error at a number of speeds can sometimes be obtained from the manufacturer or may be computed by a flight test over a known distance on the ground at a fixed altitude both up and down wind.

From the true airspeed at a known altitude and temperature the correct indicated airspeed is computed.

While you're making these speed runs note the r.p.m. on the tachometer for each run. A fixed pitch prop takes the same size bite out of the air for each turn regardless of the temperature or altitude in level flight. This means that r.p.m. is a pretty good measure of true airspeed—but only in level flight. Make up a little card showing corresponding r.p.m.s and true airspeeds; it may save you a lot of calculating when you are navigating by dead reckoning.

Airspeed is controlled by the elevators, not by throttle as is commonly thought. The elevator trim tab setting determines the "hands-off" speed, but it's the pilot's job to use the stick to correct for the bumps and to stop the slow nose-up, nose-down oscillations. When a bump causes the plane to nose up and lose speed, its built-in stability makes it nose heavy and it pitches down and gains speed automatically. Instead of leveling off at the trim speed it dives a little farther, to a higher-than-trim speed. Its stability then causes it to nose up automatically. This cycle repeats but in a well-balanced airplane gradually dies out.

When this happens in rough air a common mistake is to chase the airspeed. That is, to pull back when the speed is low and push forward when the speed is high. This process causes the plane to exaggerate the climb and dive because in each case the plane is about to do of its own accord what the pilot makes it overdo. A better practice is to hold a slight back pressure when the needle reaches a minimum speed in an oscillation and very slowly release this pressure as the ship increases toward the trim speed. The opposite approach may be used, catching the airspeed at its maximum and using forward pressure.

Ice is sneaky stuff. You fly along carefree and happy enjoying the scenery and occasionally pushing the throttle up to hold the altitude and r.p.m. right on the nose. That something is amiss never enters your mind until, after a few moments of sputtering, there is sudden quiet—and a smooth piece of varnished wood sticks up in front of the cowl. It's too late to do anything but look for a soft spot in that scenery. By the way, the throttle is wide open.

On lightplanes without injection type carburetors, icing is the No. 1 cause of forced landings. That free air temperature dial is there for a real purpose. When it shows from 25° to 40° and there is visible moisture in the form of haze, rain or snow, the use of carburetor heat is strongly recommended.

If you want to get any information out of a magnetic compass you've got to toe the line first. Until you decide to go straight in some direction and at a constant speed, the compass is not going to give you any clues as to what direction you are going. A course can't be held by compass alone. In contact flight a straight course is held by reference to landmarks, in instrument flight by reference to a gyro; in either case don't expect the right answer unless the airspeed is steady. In rough air you have to be satisfied with estimating the average position. This can be done with remarkable precision after a little practice. Even with a 60° oscillation the average pilot should be able to estimate to 5° after two or three swings.

Compass errors due to turning and acceleration are familiar to all pilots. On a N or S heading, turning causes maximum errors, while fore and aft accelerations have no effect. On E or W headings, acceleration causes the big errors and the turning has little effect. Hence, in smooth air where the airspeed is easily held constant, it is comparatively easy to hold easterly or westerly courses but difficult to hold northerly or southerly ones. This fact often instills false confidence in a novice who has made his first long cross-country trip in an east-west direction.

To steer a true course the compass should

(Continued on page 56)

15 YEARS AGO

FROM the July, 1933, issue of this magazine:

The "Flying Tea Kettle" was the first steam-powered plane that actually flew—three successful flights were made in California. The steam power plant was installed in a Travel Air trainer. It was developed by Besler brothers, Oakland, Calif., and was really a development of about 50 basic patents. The unit consisted of a two-cylinder compound double-acting V type engine. With 1,200 pounds inlet pressure, the engine delivered approximately 150 h.p. at 1,625 r.p.m.

Transatlantic flight of 24 Italian seaplanes from Rome to Chicago, under the command of Gen. Italo Balbo, Italian Minister of Aeronautics, was a big aviation feature of the Chicago Century of Progress exhibition.

An automatic stability device for correcting lateral unbalance, called the Vance stabilizer, was invented by Dr. C. H. Vance, Pomona, Calif. Two fins were pivoted at the center of each wing and connected with the ailerons so that the aileron flaps could be raised or lowered by the lateral swinging of the pivoted fins. Test flights with the stabilizer proved that the plane could not be forced into a spin, a side-slip nor a skid without immediately righting itself.

Stinson's trimotor transport, Type "U", was a 10-passenger plane of rather unusual design. It had a large upper wing and two short stubby lower wings which stored baggage and mail. Powered by three 240-h.p. Lycoming engines, it had a top speed of 137 m.p.h.

A Russian bomber, Type OP-3, with a long, cigar-shaped fuselage, closely resembled Boeing's Y1B-19 two-engined bomber, according to a flight photograph taken at maneuvers held on the 15th anniversary of the Soviet Union.

An Italian Macchi seaplane broke the world's speed record when it flew the Lake Garda course at a speed of 423.522 m.p.h. Former mark was 406 m.p.h. (plus) by an English Supermarine during the past Schneider trophy race.

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The United States is now the accepted world leader and world power. For centuries Britain occupied this position with her great fleet and merchant marine. Today, leadership is dependent upon strong air power and airlines; airlines that will become the vehicle of international trade—the firm basis of world power. New developments in aviation and the rapid expansion of this industry offer unlimited futures to young men with proper training. To achieve success in the following years you must prepare now.

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The Parachute Technician's Certificate has helped many Spartan graduates to supplement their income and is a valuable asset to anyone planning to have his own repair and service operations.

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Radio-Electronics is fast becoming a great industry with opportunities for the well-trained in aviation and many other industries that are rapidly developing hundreds of new applications. Train to become an Engineer or Technician.

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LOGGING TIME

WITH HY SHERIDAN

Captain, American Airlines

PRIVATE LINE . . . On our DC-6 we have an announcing system. The pilot can turn on a loud speaker and talk to his passengers without their being able to talk back. The mike we use is the same old hand phone that we always had to talk with the stewardess. The pilot can talk to her with the switch in one position, and to the passengers with the switch in the second position.

A few days ago, my leg man informs me, one of our oaty pilots was sailing along at 19,000 feet and pretty bored with it all. Forgetting the switch was still in second position, he brought down the house when he lifted the phone and called up the stewardess:

"Come on up here, you chubby little rascal, and give me some smoochin'!"

★ ★ ★

Overheard a bit of somewhat disillusioned conversation among airline employees standing around a delayed airliner.

"What are we waitin' for?"

"We're waitin' so the passengers will appreciate it when we go."

★ ★ ★

With an airplane you don't have time to be in a hurry.

★ ★ ★

I was getting coffee in the cabin of my Slick Six one Sunday recently and overheard a Hollywood-bound mother giving some sage advice to her daughter who would bear watching—by practically anyone.

"When you say 'no' to a man, darling," she admonished, "be positive."

★ ★ ★

TOOLING ALONG WITH TILLY . . . Bill Key of the Aircraft Industries Association recently called our attention to the following statement on helicopter development in a recent issue of *Aviation Week:*

". . . . experience in Argentina revealed the danger of such a situation with the present fixed *wench* in the cabin."

I help the boys fix plane and car—
I hardly need to ment-
Ion why I am so popular;
I am a monkey wench.

★ ★ ★

FARM NOTES . . . The straight line flight between Buffalo and Detroit lies over Canada. On about a 120-mile stretch the main crop is tobacco. They say more burley is grown there than in all of Kentucky. One of the pilots sent the following Flight Report to his passengers:

In this Canadian neighborhood
The principal crops that are had
Are tobacco when the weather's good—
And children when it's bad.

★ ★ ★

THE COSTS OF FLYING . . . Harold D. Koontz, assistant to the president of TWA, recently complained about the high costs of airplanes and their parts.

"I never could understand why the Western Auto Stores could sell a perfectly good automobile ash tray for 50 cents whereas a similar ash tray in an airplane costs many times as much," Koontz complained.

"When a *Constellation* galley, which to me was just a shaped piece of stainless steel, cost as much as three Cadillac convertibles, I must confess I had a feeling of being completely lost."

Koontz tells of a company that tried to save money by buying empty ice cream containers instead of the more expensive airplane "urp cups." But even they had to give up this economy when they found imprinted on the lids of each cup, "Thank you. Come again."

★ ★ ★

CULTIVATED PILOTS . . . I am a well-cultivated pilot. Reason: an epidemic of folliculitis, a fungus infection of the scalp now going around among pilots. It is spread by the radio head-sets. This fungus is a plant, you know, and it's amazing how many pilots have gone to grass.

The doctor took one look at me and said, "Aha! Your head is a jungle! You have tricho-phyton."

"Huh?" I gasped.

"It's one of the fungi," the doctor expounded. "They grow like vines. When the stem comes to a pore it puts down a root and gets irrigation from your sweat glands and food from your sebaceous glands."

If this thing keeps up, a pilot won't know whether to go to a barber or a horticulturist. We may yet hear one pilot greet another with, "What are you this season, Jim?"

"Johnny-jump-up. And you?"

"I'm a sweet pea."

★ ★ ★

Sadie the Stewardess says it's a wonder there aren't more writers because all the men she knows have ideas. . . .

(Continued from page 54)

be swung frequently and the correction card filled out correctly for each 30° heading. Don't lose complete faith just because you believe the corrections aren't quite right. With an error of 5° and checkpoints 10 miles apart, the actual distance off-course will be only ¾ mile and at that distance the checkpoint can easily be identified and a correction made.

A 65-h.p. engine seems to have just about all it can handle with two people and three hours of gas, hence the baggage allowance on most current puddle jumpers is very small. Even so, the most valuable 10 pounds that can be carried for real traveling is in the form of a low-frequency radio receiver in your plane.

Flying the beams contact is a cinch, so no long-winded discussion seems in order. Referring to the chart, get near one of 'em as if it were a railroad and assume the published heading with estimated drift correction. If you drift off and hear a letter A or N, apply a 5° correction and see how that rides. There's a strong tendency to forget all about checkpoints and groundspeed once you're sailing smoothly along a known beam. In case of engine trouble or a sudden realization that the gas is low, it's smart to know exactly how far to the nearest airport. Keep checking groundspeed and estimating arrival time to the next checkpoint, keeping in mind that your gasoline mileage is highly dependent on the wind.

If you're lost off airways, you can orient yourself quickly by tuning in rapid succession several ranges in different directions from your supposed position. Note the reception, A or N signals. Referring to the chart, you can usually narrow your position to a very small area. Head toward a near leg and follow it to the station or an intersection for a positive fix. If only one station can be received, the only sure method of orientation is to fly the average bisector of the "A" or "N" quadrant in an arbitrary direction, turn down the volume, and listen for a fade or build in the strength of the signal.

Some antennas have a directional effect (due to shielding by the fuselage) which furnishes an easy method of quadrant identification. If the ship is flown in a steeply-banked level turn the signal will vary in loudness with heading. It will be loudest when the antenna is between the airplane and station. This check will tell you immediately which direction to fly on the bisector and save the time of waiting for a fade out.

Most range stations broadcast the weather reports for all surrounding country at 15 and 45 minutes after the hour. Don't miss them. They give not only weather information, but recent changes in the beam headings, airport conditions and winds on the ground.

If you are bewildered by the complex panel of a transport plane and wonder how any human can possibly comprehend all that, remember this: it can be flown without any of them. Each dial is there to answer a question which might arise in the pilot's mind, and which would probably worry him if the instrument were not there. Maybe most of us pilots don't worry enough. END

Aeromatic® out-performs them all in split-second emergencies . . .

Four Lives and a new ship were at stake . . . but the *automatic* action of the AEROMATIC Propeller gave pilot Faulkner split-second full power with flat pitch. Split-second, automatic pitch is what counts in emergencies . . . it counts in normal operations, too.

POWER LINES cut his final approach at the last minute! The pilot, Mr. Edward Faulkner, president of Faulkner Aviation Industries, was really up against it! He had a full load, no wind and an air speed of only 60 MPH! Here's his own story of what happened . . .

"WHILE fully loaded and giving a demonstration, I was coming in to land on an unfamiliar runway. I did not notice the power lines until they were directly in front of me. My air speed was only 60 MPH . . . I applied full throttle at once, attempting to clear the lines, or force my way through them. Our landing gear was caught momentarily on the wires . . . but we ended up in a normal landing . . . as though nothing had happened. No one was hurt. The damage was negligible. We all agreed that a serious crash had been averted due to the rugged stability and safety factors of the Bellanca Cruisair and the fact that *the Aeromatic Propeller immediately went into flat pitch and allowed us instant full power.* I continued my demonstration with the same passengers and, as a result, obtained five orders for planes, *all to be equipped with Aeromatic Propellers.*"

¼ SHORTER TAKE-OFF: Automatically, with the engine at full throttle, Aeromatic Propeller assumes low pitch. Gets plane off ground quickly with full take-off power.

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WRITE FOR INFORMATION: Whether you own or plan to buy a new plane, write today to your manufacturer or distributor and ask about *Aeromatic.* Or write for your free AEROMATIC booklet: Koppers Co., Inc., Aeromatic Propeller Dept., 217 Scott St., Baltimore 3, Md.

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The propeller with a brain KOPPERS *for your personal plane*

Air-Controlled Automatic Propeller—Licensed under Patents of Everel Propeller Corp.

The New Look in Air Armies

(Continued from page 17)

not have enough planes; all infantry materiel is not air-portable; the ultimate in cargo planes has not even been designed.

Then why all the furor about airborne operations?

The Air Force and the Army are in a stage of transition, looking toward the day when the air shall supplant the sea as an avenue for attacks against enemy terrain. New planes have been designed which will greatly facilitate the movement of troops and equipment. But these planes today are being used for little more than test tubes for future operations. We don't have any C-120s (Fairchild's new detachable cargo compartment transport), for which the prototype contracts have recently been granted. The C-119 is not operational, and only a comparative handful of the older C-82s are presently available. A total of 220 C-82s has been ordered, but not all have been delivered. Production on an order of 37 C-119Bs is scheduled to begin in September. And the C-54s, C-47s and C-46s of the last war are obsolescent for truly "air Army" use in any future slugging war. They weren't designed for the complex problems involved in airborne operations.

Nonetheless, the Pentagon planners do have blueprints for aerial operations which in the future could change entirely our tactical concepts. They visualize a situation in which, instead of establishing beachheads in sea-going landing craft, our armies will move to war in aerial "assault craft," and will be concerned not with the frontiers of enemy nations but with vital areas within the nations themselves.

The ultimate goal is an army that can attack the enemy by air and can continue fighting with supplies and support brought in by air.

Tremendous strides have been made in creating transports capable of carrying vast numbers of troops. In World War II's last airborne operation it took nine planes of the C-47 type, five of the C-46, to transport an infantry company. Today, the C-82, with 10,000 pound rated capacity, can move a combat company with three planes. And the C-99, cargo version of the B-36, will be able to carry 400 men or 100,000 pounds of equipment including a light tank.

New planes will give the future air army a "new look" in the broadest sense of the term.

For example, the C-120 will be a "pod-type" plane which can shuttle about a cargo container with a capacity of 2,900 cubic feet and a gross weight of nine tons. It will accommodate 36 litter cases. Advantages of the new-type plane are patent: the detachable cargo fuselage can be moved about like a highway trailer. Planes in airborne operations can swoop into small fields, unhitch their "pods" and be off the ground in a matter of minutes. After the cargo containers are unloaded, another plane can pick them up and return them to bases for more equipment or troops.

Or, another possibility suggests itself. Once detached from planes in combat zones, the pods can be used for command posts, aid stations, message centers and troop shelters. Where the tactical situation will not require additional dispersion of supplies, the pods themselves can serve as supply depots.

Too, the design of the C-120's pod is being coordinated with Air Materiel Command's helicopter studies, looking toward development of a standard pack for both airframes. When the cargo containers are unhitched from the C-120 at forward landing areas, they can be moved one jump closer to the front lines via helicopter.

Main criticism of the C-120 is one which has been leveled at its predecessors, the C-82 and C-119. It will be too slow and will present a large target. The C-82, for example, cruises at about 185 m.p.h.

Even so, this type of plane will probably form the backbone of the "air army" for the next few years. Contemplated makeup of the air-transported army will be two corps, each having one airborne division and two standard infantry divisions. The assault landing, on which an airhead would be seized and emergency landing fields prepared, would be made by the airborne division with paratroops and glider troops. Some of their equipment would be dropped by parachute, with the heavier materiel being dropped with adaptations of the Germans' ribbon chutes.

Tactical implications of this kind of army are easy to see. An enemy wouldn't be able to defend just his perimeter. He would have to be on guard constantly at every vital installation in the nation. Air armies could attack directly such centers as atomic war plants without recourse to preliminary costly land campaigns.

But two Army General Staff officers warn against the "self-hypnosis" which would lead us to believe such operations are feasible today. Writing in the Infantry Journal, Maj. Donald T. Kellett and Maj. William Friedman say there are not sufficient military aircraft of the transport type available now, or in the foreseeable future, to transport a single airborne division. Today, it's all pure theory—this talk of an air army.

Under the 70-group air program, the Air Force would have only 480 troop transports, including C-82s, C-54s, C-47s and C-46s. The blunt facts are that it would take 910 troop transports of advanced types (not World War II planes) to move the 11,000,000 pounds of men and equipment in an entire airborne division.

Consequently, the air army with its "new look" must be relegated to the future, when even gliders and paratroops may be unnecessary. The new look, when and if it becomes possible, will feature transports with short-field capabilities which can shuttle in and out of battle standard armies with all their necessary equipment. Giant strategic transports will move thousands of troops to jumping-off places, where they will load into assault craft such as C-120s and perhaps C-119s and move directly into combat. They will be assured of continued supply because all army equipment will be airportable.

Huge tasks confront the molders of the

C-82 drops howitzer, using ribbon parachute. Small artillery pieces, jeeps and heavy equipment can be parachuted from present planes, but larger field guns and vehicles still pose a problem. Tanks and heavy engineer equipment still aren't airportable.

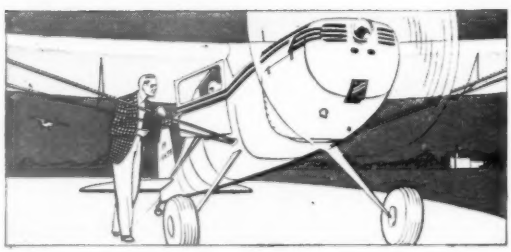
PLANE FAX

A page of service tips for private flyers and fixed-base operators

New warehouse signs boon to navigation

To help make cross-country flying more pleasant, easier and more convenient for private flyers, Standard of California is painting town names on the roofs of about 600 of its warehouses in the seven western states, Alaska and Hawaii. About half have already been painted while the remainder will be completed within the near future.

Veteran flyers have expressed appreciation for this project, saying that the signs are clearly visible from high altitudes and aid all flying where air-ground contact is maintained. It is expected that they will eliminate many mistakes in identifying towns which look alike from the air.



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air army, however. Some current research and development projects were listed recently by Maj. Gen. Doyle O. Hickey, chief of the development section of the Army Ground Forces:

1. *Improvement in present cargo planes.* Models now operational should have increased range and speed. The Army would also like to obtain better devices for handling, securing and delivering cargo; and would like to develop greater versatility of use for currently operational craft. Another important objective is that of devising landing deceleration and take-off acceleration devices to increase the usefulness of short fields.

2. *Cargo plane development.* The goal, General Hickey says, is a plane which will "carry, from a dimensional point of view, all equipment within its range-weight capabilities." Future aircraft should have greater range, speed, and payload capacity; better all-weather characteristics; improved cargo-handling, securing and discharging facilities; and more versatility in carrying equipment.

The Army also seeks detachable compartments (such as are planned for the C-120) which may eliminate the need for gliders and parachutes.

3. *Improved gliders.* Basic current objectives are a reinforced nose, improved glider-to-tug intercommunication, and improved acceleration and deceleration devices. New gliders will have all-metal construction and better aerodynamic characteristics. They will also have improved cargo-loading facilities and better carrying capacity, both dimensionally and from a range-weight viewpoint. The present tow-rope may be eliminated by a rigid-tow method.

General Hickey also points out that the Army is doing research on helicopters and that work in this direction can conceivably discover applications of the rotary wing principle "which will enable any airplane to take off and land vertically."

In the meantime, the Army is interested in developing new helicopters which will possibly be adaptable for use in carrying detachable cargo compartments, such as those contemplated on the C-120.

The development section chief also lists a number of improvements sought in airborne equipment. Adaptation of principles of the German ribbon parachute to the Army's troop-carrying parachutes is seen as a possibility.

General Hickey believes the standard Army unit of the future will be airportable. Given time, the Air Force is expected to produce planes which can carry all standard Army equipment. In procuring current materiel it has been noticed for some months that Army officers are keenly interested in airportable equipment.

That's a healthy sign, and points toward an eventual change-over from the land to the air concept in Ground Force operations.

But, as of today, it's only a signpost indicating the direction of Air Force and Army thinking. The "new look" is a thing of the future. Today's armies, even today's divisions, are not airborne. Should war come any time soon, the U. S. would be lucky to put half a division on a 100 per cent airborne basis. END

CIVIL AVIATION GETS NEW BOSSES

NEW CAB chairman, succeeding Dean James M. Landis, is Joseph J. O'Connell, Jr., who took office in April for a six-year term which expires December 31, 1953. O'Connell has had long experience with various Government agencies and is impatient with the red tape that traditionally enmeshes so many Government activities.

His talk is refreshingly free of "gobbledygook," the semi-official run-around language of Washington. Testifying before the Senate committee that handled his confirmation, he spoke forthrightly and candidly. Asked what he knew about aviation, he replied: "Nothing whatsoever." He believes his legal background will aid him in carrying on the important work of the CAB while the Board's technical men can keep him supplied with the information he needs.

O'Connell does not agree that setting up an independent office will solve the air safety problem. He feels that the CAB would still have to promulgate the laws, and believes it should continue to investigate air accidents, since it must change or correct regulations in accordance with its experience and findings.

The new CAB chairman was born in Saranac Lake, N. Y., November 8, 1905. He was graduated from the University of Vermont and Fordham University School of Law, and was admitted to the New York bar in 1931. After practicing in New York for three years he was employed by the Public Works Administration in 1933. In 1938 he joined the Treasury Department where he served first as special assistant to the general counsel, then as assistant general counsel, and finally, beginning in 1944, as general counsel. He resigned last year to become a member of a Washington law firm.

In the Treasury Department, O'Connell's work included narcotics prosecutions. This has not discouraged him from an addiction to big fat cigars, however. He is also a sports fan. O'Connell is married and has two young daughters.

DELOS W. RENTZEL may do some heavy-handed revamping in CAA if he's given an opportunity. The 38-year-old Texan, recently confirmed as Administrator of Civil Aeronautics, is considered a hard-hitting executive, impatient of official red-tape. Insiders believe his nomination presages a New Deal in CAA.

But he may find himself out of a job before he gets settled in CAA's Department of Commerce suites. Political dopesters believe if CAA reorganization is enacted by Congress, creating a single post of Director of Civil Aeronautics, that Assistant Secretary of Commerce for Air John R. Alison will get the nod for the post.

As things stand now, however, "Del" Rentzel is firmly ensconced in his new job. He comes to CAA with a record of aggressive leadership, both as president of Aeronautical Radio, Inc., and as Chairman of the Radio Technical Commission for Aeronautics.

Rentzel's past actions don't indicate a tendency to molly-coddle bureaucracy. In fact, the 6 ft. 2 in. Administrator has demonstrated an adeptness for establishing radio facilities throughout the world in the face of political buffeting and pressure. Especially in Mexico, where he organized Aeronautical Radio de Mexico, he earned a reputation for toughness. Rentzel says his job there "was like organizing a complete CAA in Mexico"—and while acknowledging that he accumulated a full quota of enemies south of the border, he feels there was need for "firmness, or the whole show would have fallen apart."

In early statements, the new Administrator announced no startling changes in CAA's setup. But he was insistent upon one thing: he says the CAA should do less "policing" and more "development" of private flying. He also suggests that "new blood" from the industry might pep up CAA.

Rentzel, who is a member of AOPA, is co-owner of a Luscombe, and lives in Park Fairfax, Va. He is married, and has two sons.

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Let's "Imagineer" a Roadable

(Continued from page 33)

gear was forgotten until the Skycar I designed revived it in 1929.

All of these things are pieces in the picture puzzle which we must put together to make a roadable air vehicle.

There was something in Waldo Waterman's roadable tailless plane, with the three-wheeled car running-gear, that is worth study before we start.

Flap development of recent years should be a part of anyone's knowledge before he starts a new design.

We should be familiar with the latest metals available, and the most recent riveting and welding techniques. We should know about wing curves and their characteristic of lift, C.P. movement and structural possibilities.

Propellers, brakes, instruments, methods of accomplishing non-stall results; the good and bad of Fred Weick's designs; Koppen's big rudder approach; the new recent studies of small two-engined four-passenger planes —all are grist for this knowledge mill of ideas that we must draw from.

And don't forget Waterman's plane with springs on the wings to spill the rough air; and study Spratt's controllable wing design as perhaps the simplest of all.

No one knows which lead will eventually win out but it will be determined by the public and its reaction, never by whether the pilots *per se* like it or not.

But let's get to our actual problem and get something definite in mind for a beginning.

To the public the term "roadable airplane" means a combination airplane and motor car. They visualize a good car as is, with a good airplane, as is, somehow perched on top of it to enable it to fly away. They take it for granted that the car will be as big and as good as that they have now, and the plane comparable in performance and cost with our usual private planes.

Some engineers have thought that way too, but it is by no means so simple. In fact it is so far from simple that no one, to date, has had ingenuity enough even to outline how one could attach the motor car without adding too much weight, or get the plane to fly with enough performance left to make it worth while.

The final design, it would seem now, will be a good plane that can move itself safely on the ground as a motor car, with its wings folded and taken along, and good for city speeds and not too great distances. It would primarily be a good airplane; second, a usable ground vehicle.

Others are working on the opposite idea— a good car and a just usable airplane.

I prefer the former.

The new air vehicle I am talking about will involve much more than just combining an airplane and an automobile, as they are now conceived.

The airplane must be revised so it can use a motor car arrangement of some kind as part of its structure, and the motor car part must be so re-hashed and lightened as to become the real integral part of this new nebulous flying motor car.

But that is not all.

This flying motor car must be designed for the motor car public to own and drive safely.

This will demand new things never thought necessary by the airplane fraternity. But they must be accomplished before this real mass of desiring purchasers can be uncovered.

One climbs into a motor car from ground level without any acrobatics or structural parts in the way. He sits down without having done any climbing into the vehicle, and takes hold of the wheel as the steering medium of the car. He has a foot throttle and he knows what it is for.

The motor car man will want all this in his airplane. That plane must steer solely by the steering wheel.

When the pilot of tomorrow wants to go right he turns the wheel to the right and his plane goes to the right whether on land or in the air.

If he wants his car to have more power he steps on the foot throttle. But in the plane, if he leaves his foot down he will climb; the more down, the more climb. If he lets up on his foot he comes down.

The speed at which he goes up and down depends on his wing setting. If we use a speed lever which resembles the gear shift lever on a car, and which determines the wing setting, then we can set lift for take-off, level flight, approach, or landing, and leave it alone. There'll be gust problems, of course, but we can have the wings spill the gusts by springs, or the like, or can take the George Spratt approach and hinge the wing for constant lift as set by the speed lever.

Silly—but possible.

That means, too, a constant speed approach. Throttle on or off the speed would be the same—just the descent rate different. Think of the simplicity of hitting a spot for landing if the plane were able to keep a constant speed during the entire landing period.

The motorist is used to riding level too. He doesn't want to nose the ship down. That gives the sensation of falling. He wants to settle down on an even keel, and we can fix that by having all four landing wheels touch at once.

When a motorist gets into a fog all he has to do is steer and keep out of other people's way. He doesn't have to worry about his machine rolling over of its own unbalance, or spinning out, or being thrown over backwards by the torque of its own wheels.

The dub roadable owner will have to be able to fly into and through a cloud without other than directional certainty, and be sure that his ship will come out right-side-up, barring a thunderhead or obvious storm condition when he won't be out anyway but driving on the ground. He doesn't want acrobatics, but security against acrobatics under the most possible conditions.

Again, just as motor cars are being designed for better road vision, the flying flivver must have better vision than has been obtained in our small ships.

One must be able to see right and left in a complete arc before making a right or left turn. He must be able to see straight down, and straight back.

The four-wheel landing gear may be castered as a plane, rear wheels fixed as a car. Side wind landing characteristics should be better than now.

So come on with all your criticisms, but don't anybody write and say it can't be done—particularly mathematicians.

I made a private-owner plane once—yea twice—and flew both and still survive.

In the first *Skycar* I used the Wayne County Airport runways crosswise, never lengthwise. On one occasion I landed at Wright Field on the apron in front of the hangar, and another time on the cinders in front of the Stinson office with La Motte Cohu and his pipe in the back seat.

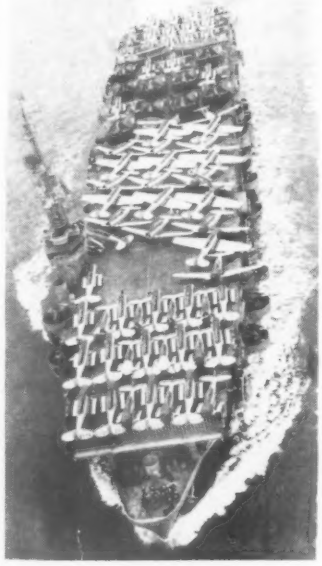
This *Skycar* was the "landingest" plane ever built for the air, and it had a lot of other good things too.

It marked the revival of the three-wheeled landing gear which was the reason for its good landings.

It was a pusher outrigger job with a car door and a regular car entrance for the passengers.

And with an 85-h.p. Warner unenclosed it cruised at 104 m.p.h.

Al Johnson of Consolidated flew it, Ralph Upson flew it, Louise Thaden flew it, and I used it for upwards of three years of personal flying.



PLANES FOR TURKEY

UNITED STATES planes for the Turkish air force sail under Golden Gate Bridge, San Francisco Bay, aboard the U. S. *Rendova*. The planes include more than 70 North American AT-6s for training Turkish pilots, but U. S. Navy combat types are also shown on this photograph, including Grumman *Avenger* dive-bombers. This was one of three carrier loads of U. S. planes sent to aid Turkey.

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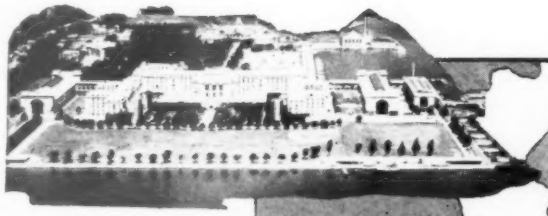

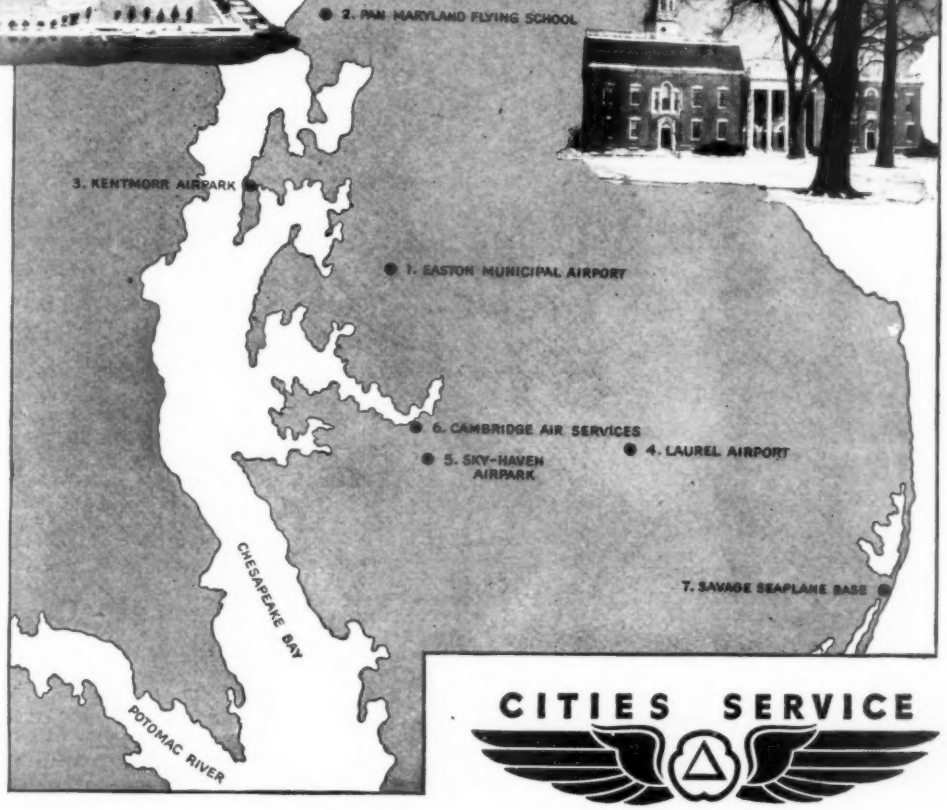

Facts and Figures

1. Easton Municipal Airport
Two—4000' hard runways. Fixed base operation—Major aircraft and engine repair. National Airmotive Corporation. Flight School, Charter and Sightseeing Trips.

2. Pan-Maryland Flying School
Rock Hall, Maryland
2 Turf runways, Flight School and Charter Trips.

3. Kentmorr Airpark
Stevensville, Maryland
All season air-strip—2800' x 300'. Recreation center for guests.

4. Laurel Airport
Laurel Delaware
2 runways—NW-SE 2000', SW-NE 1800', Flight School, Charter Trips, Minor Repairs.

5. Sky-Haven Airpark
Cambridge, Md.

6. Cambridge Air Services
Cambridge, Md.
Land and Seaplane Operations, Flight School, Charter Trips.

7. Savage Seaplane Base
Ocean City, Maryland
Seaplane operation only.

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The second *Skycar* was built much on the lay-out of the first one but with a more modern engine—Franklin—and of an experimental stainless steel material.

The steel structures worked out fine except for costs, and all static test and requirements were more than met. In its flight tests it went through everything with flying colors with some extra work done on engine cooling in back.

The steel welds were disappointing, however, and in the thin gauges were not a service success.

The plane was excellent in flying quality and control, and faster than expected.

The big mistake was the low tail assembly which cleared the ground by so slim a margin in landing that we dared not set it down even at its normal landing speed for fear of hitting the tail.

Yet in it, we flew the full 9,000-ft. length of the Willow Run runway with two aboard, at an indicated air speed of 45 m.p.h. not over 50 feet up.

In other words, the plane was controllable enough so that with full load it could have been power-landed at 45 m.p.h., though because of the low tail we had to land at 60 m.p.h.

It was this incident that convinced me of the foolishness of having scads of take-off horsepower in our present planes, and not being able to use one mouse power to help setting us back down.

However this angle is corrected in the roadable version. I have imagineered how this *Skycar* would look if made roadable.

I would make the whole job of dural, using corrugated .014 dural for coverings wherever possible. It would have a corrugated and extruded spar wing beam, with the leading edge box forming the major structure. The corrugated skin forms its own ribs to the rear of the spar.

The first real problem is how to fold the wings and still carry them on the road. The mechanism must be simple, the structure permanent, and no fittings detachable.

Each wing is double-hinged, all hinges being permanent on the tension side of the truss. The compression side is handled by toggle joints which, once in place, fixed by a worm drive, are permanent.

These wings, because of the *Skycar* layout, are behind the pilot so that when folded they do not interfere with his motor car vision. Their CG also always stays in one place and their folding is counterbalanced so that they can be operated with a minimum of work.

Since the cabin is in front, there is plenty of room for the operating mechanism on the main cabin structure bulkhead, just back of the pilot's seat.

The landing gear is four-wheeled like that on the steel *Skycar* illustrated on page 33 and which was an unquestioned success on ground maneuverability and side-wind landings.

Stick control in the first *Skycar* was standard, except that the stabilizer was set by spinning a knob on top of the stick with your thumb while flying—and all with one hand.

On the four-wheeled *Skycar* a standard steering wheel was used, as on a motor car.

In the drawings accompanying this story I have not attempted to show driving or prop mechanism. That can come later. This is merely an example of what can be done with known workable layouts combined into a roadable air vehicle.

The chief problems are those of balance—getting the CG in the right place with one or two aboard when flying, and with, say, only one aboard when on the ground.

Now we have it this far, what is wrong with it?

1. Too expensive to build—too many pieces.

2. Questionable roadability in high winds—although we drove a larger mockup than the one shown in 32 m.p.h. winds with no steering difficulty.

3. Too wide a tail for short curve road work.

4. Too complicated control mechanism—too many pulleys and corners to go around.

5. All passenger, engine and fuel weight should be more closely centered about the CG.

However, let's see what our readers can do between now and the next story to correct difficulties and suggest solutions. No use writing about the bad points—we know them, but what is your answer?

The September article will approach the same problem from a totally different angle—new assumptions, to try and get closer to that simple, practical, utility design that we all hope for. END

DO YOU KNOW..?

TEST your aviation I.Q. with this quiz. Here's how to score yourself: 100 per cent and you're an airline pilot; 90 per cent and you're a flight instructor; 80 per cent, commercial pilot; 70 per cent, private pilot; 60 per cent, student pilot; 50 per cent or less, you're a Dilbert.

1. Airplane NC-100 and airplane NC-200 are circling an airport. Both the planes banked at 45° in a coordinated turn. NC-100 flies at 100 m.p.h. and NC-200 flies at 200 m.p.h. Of the two airplanes, (a) NC-100 and NC-200 will complete a 360° turn at the same time, (b) NC-100 will complete the turn sooner than NC-200, (c) NC-200 will complete the turn sooner than NC-100?

2. The statement that an airplane climbs at the same "rate of climb" either upwind or downwind is: (a) true under any conditions for any airplane, (b) false, because a plane climbs faster upwind, (c) true, because all take-offs are normally made into the wind, (d) true only if the wind velocity is constant throughout the vertical air mass in which the climbs are made?

3. A pilot flying at 150 feet altitude is making a final approach in a 10 m.p.h. wind, trying to make a spot landing. He is using a safe, non-float glide but his *projected* glide path indicates that he is undershooting. To land closer to the spot, he should (a) raise the nose and reduce gliding speed about 10 per cent, (b) lower the nose and increase gliding speed about 10 per cent, (c) imperceptibly open the throttle, but not enough for the examiner to notice it, (d) maintain the same glide, as there is no possible way to alter the projected glide path?

4. Plane A has a large fuselage area, while plane B has a small fuselage area. Which plane will require the greater angle of crab in flying cross-wind? (a) Plane A, (b) Plane B, (c) Neither.

5. While flying at night, you see a moving green light directly ahead. This means that (a) a plane is heading toward you, (b) a plane is flying away from you, (c) a plane is flying from left to right across your course, (d) a plane is flying from right to left across your course?

6. A pilot is heading 30° true, but is making good 25° true. The angle of 5° is called: (a) wind correction angle, (b) drift angle, (c) true course, (d) compass course?

7. A pilot is flying cross-country when the engine catches fire. The best procedure, prior to bailing out or landing, would be to (a) dive the airplane and blow the fire out, (b) get out on a wing with a fire extinguisher and use it, (c) close the fuel selector valve and open the throttle, (d) close the throttle and cut the switch?

8. As a private pilot with an "Airplane, Single-Engine, Land" rating, you have purchased a DC-3. You wish to fly solo to your home field. Which of the following procedures is necessary *according to CAR*? (a) obtain a check flight, (b) obtain a multi-engine rating, (c) no requirements, (d) file a flight plan?

ANSWERS ON PAGE 81

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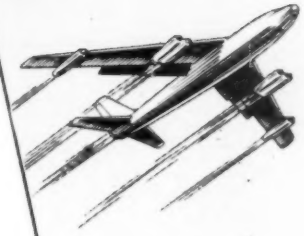
. . . as Aviation resumes its forward march



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Yellowstone Park

(Continued from page 35)

to points within the National Park.

Understandably, top attraction at the park is Old Faithful, the fabulous geyser which has spewed up steaming water at regular intervals for years. Old Faithful is not the only geyser in the park, however; there are about 3,000 others.

Despite their number-one spot in tourist folders, they are but one of many interesting features of the park. Yellowstone Lake, 7,731 feet above sea level, covers 139 square miles and has a shoreline of about 100 miles. At its outlet is the famous Fishing Bridge, which during the summer months is covered most of the time with anglers.

Other points of interest include: the Grand Canyon of the Yellowstone, the waterfalls (one, Lower Falls, is nearly twice as high as Niagara), fossil forests, and wildlife. The park is one of the largest wildlife sanctuaries in the world, containing bears, bison, deer, elk, antelopes, mountain sheep, coyotes and moose.

Most of the streams and lakes from timber line to lowest altitudes contain trout, and a few contain whitefish or grayling. Trout are wary in the much-fished, easily-accessible waters, but can be caught more readily back in mountain fastnesses. No fishing license is required. Fish transported outside, however, are subject to the laws of the states into which they are taken.

Costs within the park are not excessive, although prices are going up slightly this year. The Mammoth Springs Hotel, Old Faithful Hotel and Canyon Hotel, operated by the Yellowstone Park Company, have rates ranging from $3.50 per day for one person, without meals, in a room without bath, to $10 per day for one person in a room with bath, meals included. Cottages in connection with Mammoth Springs Hotel have rates which range from $2.25 to $4 per person.

Lodges are maintained at Old Faithful, Yellowstone Lake, Canyon, and Camp Roosevelt. Rates are $2.25 per day, and $1.50 for each additional person in a cabin. It's advisable to make reservations for all accommodations or tours by writing to the Yellowstone Park Company, Yellowstone Park, Wyo.

On Yellowstone Lake, speedboats, launches, rowboats and fishing tackle may be rented. Launches, including use of fishing tackle, cost $3.50 an hour. Half-hour boat trips on Yellowstone Lake are $1 per person. A rod, reel and landing net may be rented for $1 per day.

Horseback riding on special trails through the park is a favorite of Yellowstone visitors. Rental on horses is $1 per hour, $4 for a half day and $5 for a full eight-hour day. Guide service is available for $1.50 per hour, $4 per half-day, and $7 for a full day. Horses may not be rented without a guide.

Fields for lightplanes in the area include the following:

West Yellowstone—Though girded by pine trees and at 6,700 feet altitude, the airport is excellent during the summer season. There are no repair facilities, but 80 and 90 octane gas are sold. Wind socks are located along the north edge of the field. Flyers can get a free ride into West Yellowstone by phoning Doc Bartlett, a tavern owner and father of a former Western Air Lines pilot. Bartlett can be contacted by using the ranger phone near the hangar. Ray Maxey, advertising director for Montana, suggests that it is best to take off and land at West Yellowstone in the morning or late afternoon. During the middle of the day there is much turbulence. Dr. Herbert L. Hartley of the Seattle, Wash., AOPA unit, reports that his organization will fly to West Yellowstone in August. Hartley says that he flew into West Yellowstone several years ago on "the best trip I ever made . . . scenery is superb and the park is genuinely thrilling."

Big Springs Airport—If you circle the lodge at Big Springs before landing at the field, Mel Harris, the resort manager, will pick you up at the strip. The airport was built by the U. S. Forest Service, and obsidian sand runways are kept in good condition. There are no fees. Rates at the lodge are $2.50 per night for two persons, and $3.50 per night for four. Harris can help flyers rent automobiles if they wish to use ground transportation in the vicinity of the airport.

Red Lodge—This Montana town has an annual rodeo (July 3, 4, 5) at grounds near the airport. The city owns the field, which is not in top shape at present. It is, however, adequate for use by lightplanes. No fees are charged for tiedown or landing. W. E. Pierce, secretary of the Red Lodge Chamber of Commerce, says the organization will arrange for housing accommodations, if asked. A taxi service is available, on call, between the airport and downtown district (about one and a half miles, by road). Trips can be arranged with the taxi company whose rates average about 15 cents per mile.

Flying R—Although this is a private strip on ranch property, Manager Lee Jacobson welcomes all pilots to the field. There are no fees. At Sunset Lodge, open from May until November, rates range from $3.50 to $7.50. D. F. Richards, owner of the Flying R Ranch, says his ranch manager will be happy to give assistance to pilots, and to refer them to nearby dude ranches and resorts.

Crooker Field—The airport and lodge are located in the Madison Valley, 70 air miles from Butte and 60 miles from West Yellowstone, entrance to the park. Madison River is known for good trout fishing and the big game season is one of the longest in the U. S. with open season on deer, elk, bear; and special seasons on moose and antelope. Sportsman's Lodge, owned by Otis T. Crooker, has 16 new log cabins, with a cafe and cocktail lounge. Rates for cabins are $3 per day for one person, and from $3.50 to $4.50 per day for two. Accommodations for four persons range from $7 to $9. There is no tiedown fee but charge for hangar space is $1.50 per night.

Ashton—Operator Hale Hubbard at the Ashton Airport offers his personal services to flyers in obtaining reservations, guide service and transportation in his vicinity. If you circle the town before landing a car will pick you up at the field.

Hubbard believes his airport, though small, offers an excellent base for Flying tourists. He suggests several side trips, among them one to West Yellowstone. About 50 air miles from Ashton, the West Yellowstone field is an easy hop for the lightplane pilot. Hubbard gives instructions for the trip: "After leaving Ashton at an elevation of 5,250 feet, climb to about 7,500 feet and fly straight north. You'll fly over a timbered plateau about 6,000 feet high, with many lakes and meadows, and will see the beautiful falls of the Snake River, which flows through the plateau's lower end.

"If you're interested, you can stop at the Last Chance Inn, where there's a new strip. There's also a good fishing spot within 200 feet of the strip. If fishing's what you're after you need look no farther—because they're well able to accommodate you, with cabins and a cafe.

SOME AIRPORTS SERVING THE YELLOWSTONE AREA

Airport (Longitude & Latitude)	Nearest Town and Distance	Longest Runway	Gas Grades Available	Service Facilities	For Additional Information, Write:
Flying R (111°21'-44°38')	Henry's Lake, Ida. (Located at SE end of lake; Lodge 11½ mi.)	3,500 ft.	76 oct.		Lee Jackson, Manager, Flying R Ranch, Mack's Inn, Idaho.
Big Springs (111°17'-44°30')	Big Springs Resort, ½ mi. Yellowstone Park, 14 mi.	4,000 ft.	80 oct.	No tie-down fee.	Operated by U. S. Forest Service; Melvin L. Harris, Manager, Big Springs Resort, Big Springs, Idaho.
Ashton (111°28'-44°04')	Ashton, Ida. ¼ mi.	2,100 ft.	80 oct.		Hale Hubbard, Manager Ashton Airport, Ashton, Idaho
Gardiner	Gardiner, Mont. 1 mi.	2,200 ft.			
Red Lodge	Red Lodge, Mont. 1½ mi.	3,800 ft.	80 oct.		W. E. Pierce, Secretary, Chamber of Commerce, Red Lodge, Mont.
West Yellowstone (111°07'-44°40')	West Yellowstone, Mont., 1¼ mi.	6,700 ft.			
Cody (109°01'-44°31')	Cody, Wyoming 1 mi.	5,000 ft.	80 oct.	No tie-down fee, repairs.	
Crooker Field (111°44'-45°22')	Ennis, Montana ¼ mi.	3,800 ft.	80-90 oct.		Otis T. Crooker, Manager, Sportman's Lodge, Ennis, Montana.

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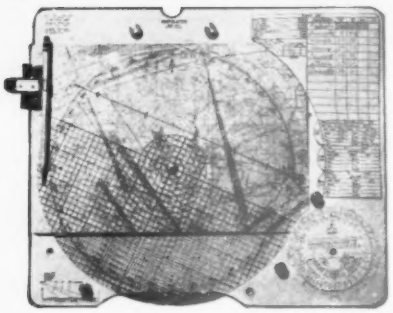

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"From Last Chance, you can hop five miles north to Big Springs. And here's a word of advice about this field: It's just as good to fly over it, and take in the scenery from the air. The approaches aren't too good and when your altimeter reads 7,150 feet (which it should when you're in the pattern), you are a long way from sea level, and flying conditions aren't the same as at lower altitudes.

"Holding a north heading from Big Springs, you can use a highway for a 'beam' and fly across what is known as Henry's Lake Flat. You'll have to add a little throttle and climb up about 500 additional feet about this time, as you'll fly over Targhee Pass into Montana—and the pass is 7,000 feet above sea level. Off to your left will be Hebgen Lake, filled with big trout, both natives and cutthroat. Looking straight ahead, you can probably see West Yellowstone. It's a good field, even used by the airlines. But you're doing high-altitude flying so always remember that safety factor, and have plenty of altitude when you start across the mountains."

Additional information on fields in the region can be obtained from local airport operators and Chambers of Commerce.

The Yellowstone Park area is shown on the Yellowstone Park Sectional (W-3).

C. K. Faught, Jr., Wyoming's Director of Aeronautics, assures flyers they'll have little difficulty in his part of the country. "There are no aviation laws that will affect the aerial tourist, and although some of our mountains are very high, the pilot won't have to go over 8,000 feet if he follows recommended air routes."

Faught's advice is good in all situations. He says: "The flyer should in all cases take advice from our experienced airport operators and stay on designated routes, and also ask advice regarding weather conditions. If this is done, the least experienced pilot will have no difficulty." CHARLES L. BLACK

Whipstall!

(Continued from page 32)

chandelles, snaprolls. You had instructed the student to make an immediate recovery as soon as the spin started. A spin was entered in most instances by bringing in sufficient back pressure to cause a stall or by decreasing the flying speed to the point where the plane stalled. You proceeded to spin out of all maneuvers until the only one left was the loop.

You thought, remembering that other time, "I'll enter the loop with low airspeed so that when I haul the stick back it'll just spin down under."

The flying was nearly over for the day and you were mentally and physically tired. Besides it was cold up there. Just this one loop and the spin and you would go on in. You dropped the nose to pick up that little extra speed, then applied back pressure on the stick without conscious thought of what you were doing. But you didn't apply very much back pressure. . . . You made it loose, plenty loose, so that it would fall out easily at the top.

The nose came up smoothly, up until it pointed straight into the blue sky above. The pressure of the controls began to lessen under your touch. You knew the ship was losing flying speed rapidly. You moved the controls but they were slack. The instrument panel jumped back and forth on its rubber mounts. Vibration! The warning burble of an airplane about to stall. You shot a quick look out along the wing to the horizon. The plane was standing perpendicular!

There was sudden silence as the ship hung suspended momentarily between earth and sky. This was it—the start of a whipstall.

Those thoughts flashed through your mind—of what a whipstall could do; of what the Old Timer had said.

The laboring engine slowed down. The windmilling prop out in front became two slowly revolving blades and then stopped altogether. You knew the plane was sliding backwards. And planes weren't built to fly backwards. Suddenly the heavy nose whipped downward, the engine hunting the ground and the wind shrieking around the cowling. The sickening lurch threw you against the safety belt. The plane was going down under in the inverted position, part of an inverted loop. You remembered that this airplane was restricted against inverted loops.

There was a tremendous pressure trying to pull you out of the cockpit; your neck was being stretched, you felt your cheeks lift upward against your face, your goggles flew off and banged against the top of your head. You felt your hands slip off the stick and your feet left the rudder pedals.

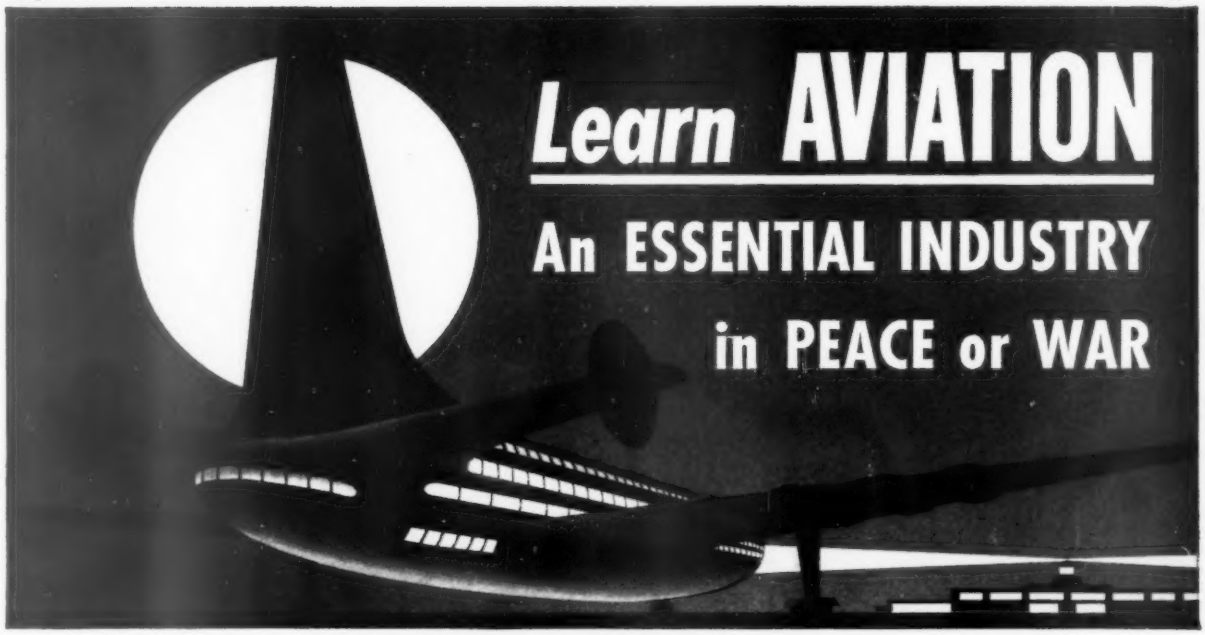
Your safety belt was slipping but you grabbed for the rim of the cockpit and hung on. The earth below swung past in an arc and the horizon came up under the nose of the plane. You felt your cheeks go back in place and the pressure against your belt slackened.

The ship had travelled an arc of 270° inverted and was starting to swing back, like the pendulum of a clock. The outward pressure began to decrease. You tried to pull yourself back into the cockpit. The nose of the ship pointed down and the prop began to windmill once more. Your left hand closed over the red knob of the wobble pump and moved it up and down. The engine coughed once and roared into life. You carefully nursed in the back pressure, bringing the airplane's nose up to the horizon and levelling it off into normal flight.

Funny how it had warmed up so much at this altitude. It had been cold when you started the loop. Your hands felt moist. You noticed that you were still holding the gosport tube in your right hand. You remembered there was a student in the other cockpit.

"Guess we kinda flubbed that one." You tried to sound casual. "That was a whipstall. You have the controls, take me back to the field."

You settled back in the seat and relaxed. You knew the Old Timer was right. You made a few resolutions. From then on you'd do your sleeping some other place than an airplane. END



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AIRviews

"Maintenance of a healthy and expandable aircraft industry is required for national security," concludes a review of our national air policy by the Congressional Aviation Policy Board.

We in the aircraft industry heartily concur with this conclusion, because we realize the value of *continuity* in this business. And only with Government cooperation can the continuous, large-scale development of aircraft of both combat and transport types be carried on.

We know that continuity of "know-how," when carried from model to model or even on re-orders of the same model, is the largest single factor in the reduction of aircraft costs. And we know there is also pronounced reduction in engineering, development, tooling and manufacturing costs where a program calls for volume production and quantity use of aircraft.

I have always been and continue to be confident about the longer-range prospects for passenger and cargo transportation by air.

In the meantime it would appear sound public policy for the Government to bear a proper share of development and production costs of new air transports and cargo planes, in exchange for the assurance that in an emergency it would instantly have available for defense and military operations, the largest and the most advanced fleets of air transports in the world.

Donald W. Douglas

PRESIDENT
DOUGLAS AIRCRAFT COMPANY, INC.
SANTA MONICA, CALIFORNIA

I Learned About . . .

(Continued from page 42)

comes all too slowly, especially if you're concentrating on something else. I suppose I was pretty fuzzy around the edges before I really noticed there was something wrong. (Later I found that my notes on the flight report ended in an illegible scrawl.)

When I finally realized something was amiss, I was so far gone I just didn't give a damn. Maybe it was an instinctive sense of self-preservation that made me ease back on the throttle, extend the dive-flaps and push the nose down toward the field. Possibly I knew all the time what I was doing and just couldn't remember after it happened. I'm still not sure.

In fact, I'm not sure of anything that happened until I came out of a blackout to find myself wondering about the peculiar gyrations of the altimeter and air speed indicator. I was at 18,000 feet! The altimeter was dropping like a cannonball and the air speed indicator was shooting up like a rocket. My dive flaps, thank God, had kept me out of the range of compressibility, so I just sat there—something like Ferdinand the Bull—just sat there dreamily. I felt only mild interest in the alarming antics of my instrument panel.

The altimeter showed 3,000 feet less when I began to snap out of it.

Then I came to my senses so fast it seemed to me I pulled out of that 20,000-foot dive in less than 1,000 feet. That quick pullout had the same effect on me as the dive from 35,000 feet. I felt dreamy again, but my senses were on the alert this time and I snapped out of it quicker.

By the time I came in for a landing I was feeling all right but plenty cognizant of the close call I had had—just because I was in a hurry when I shouldn't have been.

Later, I was assigned to high altitude tests on the Lockheed P-80. The only slow thing about that plane, as far as I was concerned, was the way we filled those oxygen tanks.

END

American Security Is Aviation's Top Priority

(Continued from page 13)

combat air groups we should have. While numbers are important, the fundamental basis of any combat air force is in the capacity of our factories to produce the most modern aircraft in the world and to produce them in such quantities that we are always ahead of the attrition losses which may be inherent in any given situation.

Long range procurement programs will do more to insure the sound, rapidly expansible industry we must have than any other single factor we can provide. That is a top priority, since it will establish a steady backlog of orders which will enable the manufacturers to plan production so that there is a constant flow of aircraft to the services, and so that highly skilled production teams can be retained on the basis of stable employment. Since the end of World War II, we have seen the industry approach bankruptcy and, because of this financial pressure, release altogether too many of its invaluable groups of workers. Enactment of our present bills for authorization of long range procurement, coupled with increased orders for the Air Force and the Navy, will automatically eliminate both these problems.

Another vital measure for national security and the economic health of both the aircraft and air transport industries is the enactment of legislation for Federal financing of transport and cargo prototype research and development. One of our airline presidents recently pointed out that 15 years ago, a new transport aircraft cost $62,500 complete. Today, a single engine in an advanced type four-engine aircraft costs $50,000. Expenditures for research on still more advanced types of such aircraft are almost astronomical, far beyond the resources of either the manufacturers or the carriers. Because the carriers are an essential auxiliary to the military air services, for which we must have the most modern types of aircraft in the largest numbers we can maintain, it should be the responsibility of the Government to provide these funds. Since they will be put to work on the airlines and will earn their keep, they will give us our reserve at a cost far lower than that of even a small "mothball" reserve in the military transport services.

One of our Congressional Aviation Policy Board recommendations urged that the military services make use of civilian units for a substantial part of their major overhaul work. This is now receiving serious consideration by the Air Force and the Navy. It is important because it would provide a reserve of men trained in the technical skills which would be needed in time of emergency, as well as keeping alive valuable civil operations for promotion of an aviation-minded citizenry.

During this period, when the Government is straining every resource to provide the immediate essentials for national defense, it is hoped that the States and the municipalities will join by doing their utmost to finance private aviation activities. Federal contributions are being made now through provision of aids to navigation and landing; through the Federal Airport Act, the establishment of air reserve units and through funds for research and development of small aircraft.

While the G.I. training program is providing considerable business for flight schools, it is not contemplated at this time that the Government will engage in a broad scale pilot-training program similar to that which preceded World War II.

It is a staggering fact that our Federal budget for fiscal 1948 shows 80 per cent of funds allotted to the prevention, prosecution and liquidation of war through five major functions of Government: national defense, veterans' services and benefits, interest on the public debt, international affairs and finance, and tax refunds. The 1949 budget is not dissimilar. So long as this situation persists, and the international picture remains threatening, we must assign priorities to those expenditures which will give us the greatest security.

END

THANK YOU AOPA

SAYS PILOT MAYNARD GUNTER

"I want to express appreciation for membership in such a fine organization. It is about the only organization 'commodity' in these inflated times that does not break a private pilot to belong to it. AOPA and Flying are an unbeatable combination for you two are really doing things in behalf of flying and the private pilot."

PILOT MAYNARD F. GUNTER
AOPA Member Pilot No. 23994

This "thank you" is not for any big spectacular *single* service that AOPA has performed for pilot Gunter. It's more than that. Like all the thousands of AOPA members Maynard Gunter appreciates the *many* consistent services afforded by this biggest and most powerful of all private aviation organizations.

The records speak for themselves. For years AOPA has set the pace in safeguarding the rights and privileges of non-scheduled pilots and aircraft owners. There is no other organization to whom so many flyers look to for protection — leadership — guidance. And certainly there is no other aviation group that gets so much tangible value for so little cash investment.

AOPA's 21-point program of private flying safety and improvement offers a bulwark of protecting strength to more thousands of active flyers than have ever before banded together for a mutual purpose. This powerful combined front is acknowledged the most dominating factor and influence in private aviation today and you, like every other flyer, owe it to yourself to start taking advantage of this hard won leadership.

Read the long list of membership benefits listed below and you'll agree that the $5.00 yearly membership fee for AOPA is the biggest bargain in years. Then note pilot Gunter's remark about the "unbeatable combination of AOPA and Flying Magazine". You know, of course, that $1.80 of your membership fee is for a yearly subscription to the special AOPA edition of Flying. Any way you look at it AOPA gives you more — of the best — for less.

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The Washington staff of AOPA will help you in personal flying problems, licenses, regulations, legal tangles, plane sales and purchases, documents, employment. Also national AOPA-Hertz Drive-Ur-Self courtesy card with special rates, AOPA Washington Newsletter; each month the special AOPA edition of FLYING magazine; TWA-AOPA courtesy card assuring service and maintenance facilities at most TWA airports, advantageous aviation insurance service; low cost aircraft finance service; distinctive AOPA pilot's wings, emblems for your plane and car, and membership card. Above all else, AOPA continuously protects and fights for your flying interests in government and other circles.

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Mystery of the Racing Rain

(Continued from page 18)

that it looks like an amoeba under a microscope, which for the edification of the practical man among my readers, looks like Yvonne De Carlo when she is, as Sadie the Stewardess puts it, brandishing her amoebum.

"Imagine," Pete says, "an army front. Suddenly a column breaks through, then another column at a different place, and they go very fast for a while, and then when they are stopped the pocket between them is gradually mopped up."

How serious this condition is to airmen any of us can imagine. You recall that some time ago several airliners were caught in the New York area. After it was all over, the head of the U. S. Weather Bureau in Washington stated that the weather in this case could not have been forecast. One of the planes, a DC-3 herded by the resourceful Capt. Johnny Booth, found itself nearly out of gas and all out of ceiling.

Captain Booth got right down at sea where there was nothing sticking up to hit and tip-toed along the ocean waves until he got to Jones Beach, where he slid his tin galleon along the sand, saving the lives of his passengers and untold money for the airline. Well, the weather that caught him was one of these . . . ah . . . amoebasts, you might say, there being no name for them yet, no polite one that is. In this case the weather finger advanced at 180 m.p.h. for three hours or a total of 540 miles, as the h..lf-hour maps that were made later showed.

What good are weather forecasts now? What good are "alternate airports" that are given you with a careless superciliousness seen nowhere else save in the horsey set? In short, where is the science of weather—back where it started?

So far as he knows, Peter Kraght (pronounced "Kraft") discovered this phenomenon. "Frankly, I don't know why this damnable thing was discovered so late," he says. "We have had a fairly dense network of reporting stations for 15 years." It is believed that Kraght invented isochrones of onset times of precipitation and made the first maps. A couple of the maps in skeleton form adorn this story. Kraght, who wrote *Meteorology for Ship and Aircraft Operation* published by Cornell Maritime Press, probably the clearest book on the subject so far, intends to make the formal disclosure of the . . . er . . . amoebast at the Air Transport Association Annual Awards Committee meeting next fall. He'll then publish his studies in the professional journals. You are here getting a preview.

Of course you know that the air mass doesn't move at 300 m.p.h., nor does any individual rain drop. What moves is the bad-weather spear-head as a condition. It is as though Jupiter leaned over from Mount Olympus and drew a finger along the top of the air mass. But you have the mental picture clear enough by now, surely.

Could the cause by electrical? Particles charged with the same sign of electricity repel each other and cannot readily co-

alesce, even if urged by lowered temperatures; if suddenly they no longer repelled each other, precipitation would begin. How about electron or alpha showers? These days the physicists are charting electron (and alpha) beams from the sun that spray our blanket of air; could these be the cause? Or does precipitation in the rear of a finger carry charges down to the ground and create a changing electro-static field that causes rapid coalescence along a path?

Norman Beers, chief at the Brookhaven National Laboratory, has suggested "an anomalous wave, a gravity wave, with an amplitude sufficient to cause the formation of natural seeding of the clouds, due to adiabatic cooling."

This idea is a bit hard for me to understand. Sadie the Stewardess says, "If you can't even depend upon gravity any more, I am going to get out of this business." For my part, I should like to suggest the notion of cooling by magnetic waves (which have been clocked at the speeds we are concerned with) mainly because the concept is silly enough to give me some scientific prestige.

People hate to give up their old comfortable ideas—especially if their jobs or professions are dependent upon them. When this is generally disseminated, the shrieks of anger and dismay will rend the air for months—as if all the banshees of Ireland had been set afire.

Nevertheless, it's clear from all this that we've got to change our idea of what causes weather. The old concepts will not explain the 300-m.p.h. fingers. And what reason is there to believe that they wholly explain other weather? Surely one or more basic sources are yet to be discovered. I feel sure that one of them is electrical.

What's your guess? Make a real try at it because it is perfectly clear that until someone finds out the cause and how to predict its action we cannot have absolute weather safety in air navigation—military, commercial or private. END

1948 Ercoupe

(Continued from page 31)

and distribution program for all airplanes produced by that company. He operates from the Erco airport at Riverdale, Md. Thus Engineering and Research no longer does anything but manufacture *Ercoupes*. Even Fred Weick, the able engineer who designed the airplane and who has done more for "simplified" flying than any other man, has left the company.

With a few relatively minor exceptions, the interior of the 1948 *Ercoupe* is very much like that of last year's model. The throttle and trim-tab knob are mounted on the center pedestal that protrudes from the instrument panel, between the two control wheels. The higher price of the 1948 model ($3,590 f.a.f.) now includes a two-way Lear radio which is mounted on the right-hand side of the instrument panel, where the glove compartment used to be.

That larger nose wheel is one of the most important changes on the new *Ercoupe*. The wheel's new size is 5.00x5—and owners operating out of rough or soft fields now

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can get a 6.00x6 nose wheel (same size as the main wheels) installed as optional equipment.

I found that the larger standard nose wheel has had some effect on the airplane's performance on the ground. It is still easy to taxi but because of the additional traction on the larger tire it takes more pressure by the pilot to steer the plane while taxiing. The larger nose wheel has also changed the new plane's cross-wind landing characteristics somewhat. I was told—probably because the larger wheel permits the wing to sit at a higher angle of attack.

I tried several cross-wind landings myself but noticed no unusual difference, although the wind was not strong enough to give me a good check. Other pilots told me that in a strong cross-wind the *Ercoupe* is a little trickier now than it was last year because of that larger nose wheel. It apparently is easier to dip a wing as the wheels touch, although the tendency is not supposed to be enough to increase the plane's present low accident rate.

The 1948 *Ercoupe's* take-off is very much the same as that of the earlier model. It gets off the ground in still air in about 10 seconds and climbs at the same rate (just over 500 f.p.m. with two people, I found). The noise level is about the same because there has been little change in the soundproofing, the canopy or windshield. I suspect it might be even a bit noisier than the 1947 model because the 85-h.p. engine is cruised at 2,400 r.p.m. instead of the 2,375 r.p.m. of the 75-h.p. version.

It takes a little while before you are able to get the new *Ercoupe* trimmed into level flight. The nose sits a good deal lower in level flight, making for excellent forward visibility. But my tendency was to keep the nose up in what looked to me like level flight but what was actually a climbing attitude. Once I got the nose down into the right position, the *Ercoupe* stepped right

HIGH SCHOOL PILOT

GID TOWNSEND, 18-year-old Ocala, Fla., high school student, isn't bored with his studies. He's the first commercial pilot in the south, and probably the first in the U. S., to qualify for his license in a high school vocational program.

Gid made a triumphal tour of Florida on his commercial cross-country several months ago. He was met by delegations of citizens at each stop en route, and was presented at Orlando with a key to the city (see photo above).

Ocala High School's Aviation Division, directed by William McLean, opened in 1944 with a mechanics school. Flight training began in 1946.

Students can earn over half their school graduation credits in the aviation division. Costs are low. Students handle maintenance, and pay only for gas and oil. Flight instructor is William Tankersley, a former P-47 pilot.

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One air-cooled 85-h.p. Continental engine

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Wing span	30 feet
Length	20 ft. 9 in.
Height	5 ft. 11 in.
Gross weight	1,400 pounds
Empty weight	820 pounds
Fuel capacity	24 gallons
Baggage allowance	65 pounds
Top speed	120 m.p.h.
Cruising speed	110 m.p.h.
Stalling speed	50 m.p.h.
Maximum range	430 miles
Rate of climb	560 f.p.m.
Service ceiling	11,000 feet

Source: Sanders Aviation, Inc.

out. I flew several short cross-country courses with the airplane, each time carrying a passenger, and was able to average a ground speed of about 110 m.p.h. at 2,400 r.p.m.

Maneuverability in the air is excellent, as it has been with all *Ercoupes*. The plane trims up easily for hands-off cruising flight. In rough air there is still some tendency for the *Ercoupe* to "hunt" laterally, a characteristic that is made much of by anti-*Ercoupe* three-control pilots. The fact remains that, so long as you are not made air-sick by this characteristic, you can fly the *Ercoupe* safely in high winds and gusty air that keeps most conventional planes on the ground.

The 1948 *Ercoupe* also retains the excellent stall characteristics of the earlier models. I stalled it several times at an indicated air speed of just over 50 m.p.h. This newest *Ercoupe*, incidentally, has an interesting feature added to its elevator. When approaching for a landing, you pull the wheel back until it bumps up against what seems to be its customary stop. But that stop is intended mainly to help the private pilot establish his glide at the proper speed with power off. As soon as the airplane is close to the ground and actually ready to land, the pilot can pull the wheel back past that stop to a final stop until the elevator has been raised 20° (previous *Ercoupes* have 13° of up-elevator). This additional elevator travel enables the pilot to pull the nose higher on a landing, and also helps him get the plane out of a short field when that is necessary.

In other respects the new *Ercoupe* has the same excellent performance of its predecessors. It also has most of the drawbacks: it is noisy, the sliding sides of the hatch rattle open and let in drafts. But there has been at least one excellent (though optional) addition to this year's model: shoulder straps. This installation costs $25 extra but is probably the least expensive single bit of insurance a pilot can buy in any lightplane.

Standard equipment in the 1948 *Ercoupe* includes the two-way radio, starter, generator, navigation lights, instrument and chart light and both the familiar foot brake and hand parking brake.

Even though it is a bit late arriving on the 1948 market, the new *Ercoupe* is an excellent airplane for the private owner. A four-place model also was planned for this year but has since been shelved indefinitely. So has the sleek twin-engined model on which Fred Weick had done so much work. END

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General 'Van'

(Continued from page 27)

the help of his uncle and, while the latter has not requested that a favor be done him, nevertheless it just makes good sense to help the nephew."

At any rate, General Van soon departed from that important post and returned to the Air Force.

The general has an excellent war record and his Ninth Air Force cooperated completely with Gen. Omar N. Bradley's 12th Army Group. He and Bradley maintained headquarters in the same town, usually near each other. They are together again at The Pentagon in Washington, with Bradley as Army chief of staff.

General Van's World War II experiences included participation in the Allied conferences at Quebec, Cairo and Teheran and some success in dealing with the Russians both at the conferences and as head of an air mission to Moscow.

The general, who is of Dutch descent, was born at Milwaukee January 24, 1899, the son of a prominent businessman. He lived with Uncle Arthur in Grand Rapids, Mich., for a time before he got his appointment to West Point. There he played football, track, hockey and boned for the air service. He was graduated 240th in his 1923 class of 261.

At West Point nothing in his record set him out as an officer who would help work out air plans for the North African operation, organize the 12th Air Force under Doolittle in 1942, assist at Big Three conferences and head the CIA and eventually the entire Air Force.

But the rugged youth who played West Point polo with a flourish in his senior year was patently of the same material as the flying general who made more than 20 combat sorties over Europe and then led the 9th Tactical Air Force in support of the ground armies thrusting across Europe.

It was five years after his graduation before his first promotion came and in November, 1929, he took over his first command—the Sixth Pursuit Squadron based at Schofield Barracks, Hawaii. After his return to the mainland in 1931 he served two years as flying instructor at Randolph Field, Tex., becoming a flight commander and deputy stage commander in 1933.

Promotions—as they did to all soldiers during those years—came slow to Vandenberg and it was not until August, 1935, that he received his captaincy and was ordered

Young Vandenberg entered the Air Service's Primary Flying School in 1924, shortly after receiving his commission.

to attend the Command and General Staff School at Fort Leavenworth, Kan. He has attended virtually all Army and air schools, and following his graduation from the Army War College in Washington in 1939 he was assigned to the plans division of the Office of the Chief of the Air Corps.

Van then began to get a few breaks—he rose to the rank of temporary colonel. A few months after the war began, Colonel Vandenberg became operations and training officer of the Air Staff. He received his first Distinguished Service Medal.

In World War II he rose to the rank of lieutenant general—he stayed a major general only a year—and won a string of decorations.

Vandenberg gets along with people—and during the war he got along famously with Generals Arnold, Bradley, Eisenhower, Spaatz, Jimmy Doolittle and many others. He hit it off well with Doolittle when he was the latter's chief of staff in North Africa, but is said to have incurred his frowns for sneaking out on combat missions.

He was popular with his crewmen and enlisted men, talking air slang with the best of them. He played volley ball and ping pong with them and usually beat them. A dashing figure in impeccable uniform, cap set at rakish angle, he always seemed to be in action.

In August, 1943, General Vandenberg was sent back to the United States as a deputy chief of air staff but after six months returned to Eisenhower as deputy commander-in-chief of the Allied Expeditionary Force. He had worked on Eisenhower's staff in 1942.

Then, in the summer of 1944, the young major general was assigned to command the 9th Air Force, his final combat task.

General Vandenberg, who was appointed vice chief of staff of the Air Force last October, became the youngest full general in U. S. military history. President Truman nominated him to a four-year term as chief of staff over two top contenders for the post—Gen. Joseph T. McNarney, who outranked Van but who allowed himself to become somewhat divorced from his air associates during the war by becoming General Marshall's deputy; and Gen. George C. Kenney, present commander of the Strategic Air Command who is credited with doing much to convert General MacArthur to an appreciation of the true value of air power.

The accent is on youth in the new Air Force. General Van himself is only 49. But, after all, flying is a young man's game.

However, the administration of the huge Department of the Air Force is another matter and could become a gigantic problem for a flying officer who has always depended on the Army for such things as logistics and procurement. Some military and Congressional leaders question whether the Air Force has struck a proper balance between youth on the one hand and age and experience on the other. They point out that most of the present leaders never went through the lean years. All of this shapes up to a major task for the new chief of staff.

"We are going to be pretty busy here bringing the Air Force up to planned level of training, efficiency and modern equipment," Vandenberg said in an interview recently. "If Congress authorizes 70 groups, it will be the end of 1952 before the job is completed."

He believes that the Air Force today is out of balance—with not enough bombers. He would remedy that with the 70 group plan. Like Spaatz and Secretary of the Air Force Symington, Vandenberg says that anything less than 70 groups would not provide a militarily sound distribution of units.

Those who meet the general for the first time interpret his apparent shyness as lack of force, but those who know him well say that it is just very good manners. They have no doubt about his tremendous capacity for work and his ability to get work out of others.

"He combines the top qualities of a soldier and a diplomat," one colonel remarked. "He certainly employed the Ninth—then the largest in the world—more effectively than any comparable force. He employed it on a day-to-day basis, frequently changing targets while in the air."

While he has a reputation for speaking up at meetings, in ordinary conversation, even with close relatives he can be quiet and shy. A recent conversation with his Cousin Arthur, son of the senator, illustrates the point.

"Hello," began the general.

"Hello," returned Arthur.

There was a long pause and finally Arthur volunteered:

"I'm coming out to your house tonight."

"Fine," was the general's reply.

Another pause of from 10 to 20 seconds.

AND THERE I WAS . . .

GOING...GOING...GONE

AS I WAS about to flare off for a landing on a small Pacific island off Central America, a sign flashed by my wing tip: "One-fourth."

Farther down the strip was another sign which said, "One-half." Still farther, as I slowed down, another sign read: "Three-fourths."

As I braked the plane to a stop at runway's end, a final sign loomed up ahead: "That's All Brother!" On the other side of that sign was a straight 200-foot drop into the Pacific.

CAPT. C. V. GLINES, AC

"I thought you'd like to know," Arthur said.

"Thanks."

Another long pause.

"I also wondered if you'd mind if I brought along a guest."

"Nope, be delighted."

Another pause.

"Well, I'll see you tonight."

"Fine."

Customary goodbyes, and the conversation was ended.

But friends aver that Van can become vocal when he wants to make a point and that he will listen at length before making a decision. Once it is made, that's that.

The general can become convinced of a point and all the arguing in the world will not change his mind. He is inclined to over-simplify important matters such as roles and missions of the armed services.

"Why, it is just as simple as anything," he told a friend after the recent Key West conference of the Joint Chiefs of Staff. "All that is in the air belongs to the Air Force, all on the ground to the Army and everything on the sea goes to the Navy."

Around the office, where he wears glasses which give him a rather stern expression, he is reported to be forceful but relaxed. There is little military pomp and at times he has been known to make flippant remarks which startle subordinates. He works with a clean desk.

One general who has been his friend for years observes: "It is easy to get acquainted with Van but hard to know him well. Most people never really figure him out."

During the war, Van was selected as the "Typical Mr. America" by some promoters who arrived at their selection by measurement of skull, hips, etc. It was embarrassing to the general, and there was no end of jibes from brother officers about his winning a male beauty contest. A girl reporter who had never met him before came in for an interview soon after the announcement and her first question was "How does it feel to be chosen as Mr. America?" The interview was short.

He is dead serious and fluent about anything having to do with aviation and reasonably interested in such lesser matters as golf, tennis, gin rummy, photography, Scotch highballs and good panatelas.

The general met his wife (who was Miss Gladys Rose of Tuxedo, N. Y.), at a dance while at West Point, married her after he got his wings.

The Vandenberg's daughter, Gloria, and her Army captain husband have a daughter, Susan Hoyt, born six months ago. Their son, Hoyt S. Vandenberg, Jr., is a West Point cadet.

General Van likes a highball in his off hours and he likes to sing. Singing was a nightly pastime with him when he commanded the 9th, though unfortunately he cannot carry a tune. Then he always wanted a lot of his own staff around him in the evening and insisted on joining with the quartet. Today he admits he is lousy at golf, after an eight-year layoff, but his friends say that beside his singing, his golf looks good.

The Air Force chief of staff still pilots his own plane, a converted B-25, when he travels. END

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The 70-Group Air Force

(Continued from page 14)

Secretary Symington put it, the extra funds provided by Congress will give us a 1950 Air Force by 1950. He was too circumspect to complete the comparison, but the fact is the 66-group program proposed by Defense Secretary Forrestal would have given us a 1945 Air Force in 1950. The $822,000,000 increase provided by Congress will give the country a larger number of the most modern types of airplanes. In addition, it restores four groups to the immediate program which the Administration plan would have deferred until the fiscal year of 1950. These are two troop carrier groups and two light bomber groups.

Stated in terms of appropriations, the stepped-up program becomes extremely complicated. One reason is that it includes both contract authority and actual appropriations. The best way to look at it is to consider it a down payment on a five-year program for national security. When the original budget was prepared for the new fiscal year, $3,054,000,000 was put down for the Air Force. Later on, the Joint Chiefs of Staff decided that with the darkening outlook abroad it was time to start expanding the Air Force, so a supplemental request for $1,133,000,000 was presented.

But then Congress started getting disturbed. Far-sighted members of both Houses who recognize the importance of an all-powerful Air Force took the position that things had reached the stage where a cautious Nellie approach was no longer sensible. So they lined up behind legislation, adding another increment of $822,000,000 to the program.

Thus, the total financial support of the 70-group program for fiscal 1949 is as follows:

	Million dollars
Original appropriation	3,054
Supplement agreed by Joint Chiefs	1,133
Modernization program voted by House of Representatives	822
Construction of installations	345
Total	5,354

It will be noted that, looking ahead, the construction of installations which are necessary will add something over $300,000,000.

It might be asked, why was not an even larger expansion voted? If a military showdown is imminent it would seem logical to speed up our aerial preparedness program even more. Senator Bridges (R) of New Hampshire who led the fight for the increased appropriation on the floor, gave the answer. He explained that "it would be unwise, even if it were possible, to foster a rapid peacetime expansion of production facilities, reaching an early peak of production, followed by a sharp decline in units required." He went on to point out that the program settled upon calls for a steady increase in contracts for military aircraft. Thus, starting with 2,911 planes in the fiscal year of 1949, it increases to 4,096 in fiscal 1950; 4,589 in fiscal 1951; and 5,200 in fiscal 1952.

The program contemplates a levelling off of military aircraft production at a constant figure of 5,200 per year, unless a still further expansion is decided upon at the end of the initial five-year period. More about this later. During the fiscal years of 1950 and 1951, the production will be largely devoted to replacing, in the 70-group regular establishment, the obsolescent aircraft of the storage reserve. Beginning in the fiscal years of 1951 and 1952, the new production will be devoted in part to keeping the regular establishment modernized, in part to developing an adequate modernized storage reserve, and in part to continuing the modernization of the first-line Air National Guard. As was brought out repeatedly on the floor, we don't want a one-punch Air Force.

AVIATION'S FORGOTTEN MAN

JOHNNY MOORE is the sole surviving witness of the first powered airplane flight and the last living man who lent a hand to the Wright brothers on December 17, 1903, when they put their flimsy craft into the wind and flew 120 feet.

Sixty-two years old now, he was 17 when he chanced by Kill Devil Hill that December and helped put the Wright plane in position for its run down the wooden rails. After watching the three other flights and then seeing the plane crash among the hummocks, Johnny casually went back to his eel pots and muskrat traps and to oblivion.

Other witnesses to the flight are now dead—Will Dough, Adam Etheridge, John T. Daniels and the two Wright brothers.

Moore doesn't seem to like crowds, oratory or bands. He stays at home in Colington, N. C., a little island lying behind Kill Devil Hill. Though he has been invited to ceremonies at the scene of man's first heavier-than-air flight, he has never appeared.

In the Senate Committee hearings, another aspect of the situation was presented by Representative Carl Hinshaw (R) of California (see page 13) who was called in to testify. Representative Hinshaw is vice chairman of the Aviation Policy Committee. He sounded the blunt warning that unless the expanded program were adopted, we could not sustain even our present Air Force and Naval Air Arm because we are relying mainly on planes taken out of storage. He pointed out that if we keep on using up planes faster than we are building them, by 1950 we would not have an aircraft industry geared up to meet our needs —unless we also start now to build up our production facilities.

Arguments about the need for a balanced defense appropriation failed to make much impression on Capitol Hill. One retort was that things are different this time because, contrary to what has been the situation in the past when we faced a number of possible enemies, we know now that an attack could come from only one place. This simplifies and sharpens the focus of our military problem.

We know that Russia is the only potential enemy country strong enough to attack us. Furthermore, we know that Russia has no Naval force to cope with ours while, on the other hand, its land forces cannot be disputed in the great Eurasian land mass.

This leaves air power as the real issue. Former Secretary of Commerce Harriman—now the roving ambassador under ERP—was quoted as having said "the only thing the Russians are afraid of is a great air force." He has spent a lot of time in Russia.

Congress was furnished with a complete breakdown of what type of planes the $822,000,000 would buy. There would be 49 bombers, of which 28 would be of the long range type. There would be 802 jet fighters. Secretary Symington testified that they comprise two models which "are as good as anything we have seen except the latest Russian jets, in design."

The total number of planes to be acquired in the fiscal year ending June 30, 1949 will be much greater when the boost recommended by the Administration, plus the regular budget allowance, are added to the Congressional increase of $822,000,000. The total number of planes to be procured by the Air Force during the fiscal year will be 2,911. This doesn't mean that all or even most of them will be delivered in the same fiscal year period.

Then part of the extra money will go toward tooling for additional production for the 70-group force and for expanding plants. The Government would retain title to all plant investment, plant changes, and production tools financed under the program.

Finally, a portion of the fund will be used to expand the sub-contracting of orders. This will reduce the expense necessary to take care of the program if the prime contractors had to handle all of the initial load and were obliged to make corresponding increases in their plans. The theory is that by encouraging subcontracting the Government will spread production over a broader base and will not force a

too-rapid expansion of the industry.

Getting down to specific planes, the 70-group program includes such modern aircraft as these: the Boeing B-50 series, the Republic F-84, the North American B-45 four-jet light bomber, the Curtiss-Wright F-87 four-jet all-weather fighter, North American's F-86 jet fighter, and the improved Lockheed F-80. According to the testimony presented during the Senate hearings, the capacity of the plants turning out aircraft engines—particularly those producing jet engines—is a more limiting factor than that of the airframe manufacturers.

While the Naval Air Arm will come in for additional money in the supplemental fund sent to Congress by the Administration, it will not receive any allotment from the $822,000,000 added to the bill on Capitol Hill. The whole Naval aviation program for the new fiscal year is about 1,500 planes. Spokesmen for the Navy told Congress that 80 per cent of the funds would be spent for carrier aircraft. By accelerating its aircraft procurement program to 1,500 planes and taking all its planes out of storage, the Navy can reach its goal of 10,700 planes by July, 1949. Previous plans did not contemplate the reaching of this goal for five years.

There has been considerable confusion as to just how an Air Force group should be defined. Since the group is used as the yardstick for planning, Congress naturally wanted to find out all it could on the subject. The information was presented something like this: While an Air Force group is similar to a regiment of ground forces from the standpoint of being a self-contained unit, it varies in size. Thus a group of heavy bombers consists of only 18 planes although it requires around 2,200 men to keep it in operation. On the other hand, a fighter group of 75 planes only requires 1,400 men to keep it in the air. The Naval air groups vary also, depending on the size of the carrier from which they operate.

Because the contract authority provided by the supplemental budget and the Congressional increase can be used immediately, the Air Force and the Navy lost no time in placing orders. They didn't need to wait until the beginning of the new fiscal year on July 1, as is the case with the regular appropriations.

A price that had to be paid for getting the program through Congress was the inclusion of a renegotiation provision by means of which the Government can trim the payments down if it finds that the contractor is making an excessive profit. There was some objection to putting in harsh language of this sort on the ground that it might make subcontractors unwilling to accept Government orders.

All prime or subcontracts are subject to renegotiation if the total orders held by a manufacturer in one year exceed $100,000 and the Secretary of National Defense believes excessive profits have been made.

Congress has taken the first step. The Air Force can now buy the all-important element of "time." But let's not imagine that all our problems are solved. Secretary Symington has stated that 70-groups are "just barely" enough to scrape by on and that Russia has "many times" more, including swept-wing fighters. END

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The House Fly's Hidden Gyro

(Continued from page 26)

for aviation within recent years.

Proof of all this came recently from an enterprising photographer who has learned how to pop flashlight bulbs faster than anybody ever popped flashlight bulbs before—and as a result has taken high speed movies which clearly show the wing action and motion of the haltares—the two tiny "whatzits" that stick out from a fly's belly and vibrate about 150 times a second in unison with the fly's wing action.

Haltares are to the fly what the flywheels of a modern gyro are to the automatic pilot, the artificial horizon, the directional gyro and other gyro instruments used in today's airplanes.

Instead of revolving, however, the haltares rely on another gyroscopic principle—the vibrating rod.

To understand the haltares, all you need is a lathe and a metal rod weighted at the end. Secure the rod in the lathe and pluck it to make it vibrate. Then turn the lathe slowly by hand. If you have plucked the rod so that it vibrates in a vertical plane, for instance, the vibration of the rod will continue in this vertical plane, even though the rod itself is turning.

The effect of this phenomenon is identical with the gyro action which comes from a revolving wheel, a rolling hoop and a spinning top. The Sperry Company, never an outfit to let an insect get it down, is now talking about the possibility of using the haltare principle in the development of new and better gyro devices.

It has already taken out two patents on possible applications of the principle. Its engineers figure that the idea could be adopted for the actual stabilization of an entire aircraft in flight—or as a substitute for the whirling wheels of the present instrument gyros, thereby eliminating the problem of bearings.

With new respect for the common housefly and its antecedents, these engineers describe how the haltares are designed for maximum momentum with minimum weight. They call the fly's anatomy "an exquisite assembly" which contains three marvels of compact engineering design: a muscular system which drives the haltares, a nervous system to detect their indications and differentiate between linear and angular movements, and a wing control system for automatically executing the orders of the nervous system.

The effect of the haltares has been known for some years. But the actual understanding of their relation to gyroscopic principles was hazy until Dr. C. H. Curran, curator of insects and spiders at the American Museum of Natural History in New York, started mulling it over in his mind.

Dr. Curran has studied insects for 45 years. He remembers when, as a boy of 12, he first experimented with the flight characteristics of the fly. He had read about a fly's "balancers"—and one day, while collecting insects, took out his pen knife and cut off one of these balancers to see what would happen to the fly. The unfortunate insect flew in a wide circle until he finally dove into the ground. He was unable to take off again.

Years later, in 1944, Dr. Curran went into the matter a little more scientifically—in conjunction with the Sperry Company. He felt that only when the movement of the haltares could be visualized would the answer come. So he hired Henry M. Lester, a specialist in high-speed photography, to take movies of a fly in flight.

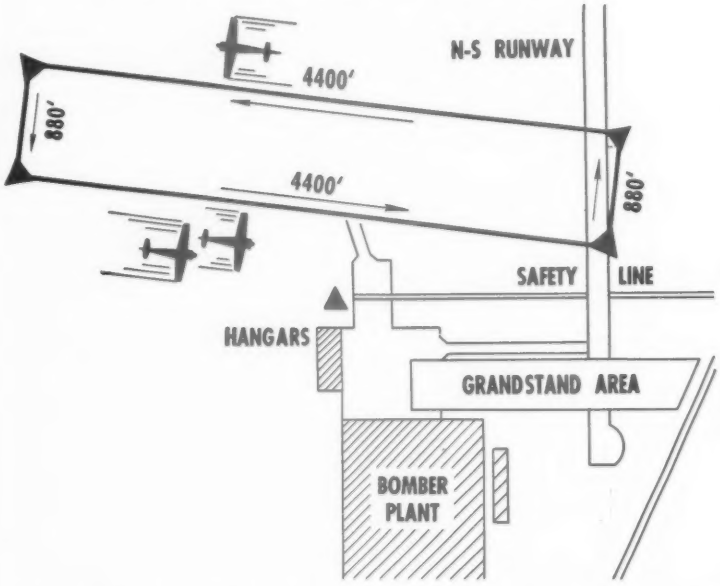
More than two years later, Lester came through with a 10-minute film showing three seconds of a fly's flight. Working at shutter speeds of 3,000 a second, he took movies which show graphically the action of the haltares. They protrude just below the base of the wings, looking like miniature golf clubs which vibrate in a vertical plane with the same rhythm as the wings, but travel in the opposite direction.

From the movies have come other facts about the fly. To make a turn, for instance, the fly "feathers" one wing and reduces the speed of that wing. At other times, either of the hind legs can be dragged to produce rudder effect.

The haltares have an amazing little muscle tissue attached to them, Dr. Curran says, and this may indicate a new method of vibration control on machinery. The muscle apparently works through exerting pressure and relying on elastic membrane for the return movement.

The fly is the most efficient of all flying things, Dr. Curran contends after seeing the movies, which have disproved the theory that a fly's wings travel in a figure eight pattern. Instead, the wings work in a "V" pattern: downstroke, followed by an upstroke, both 45° to the longitudinal axis of the fly. In both motions, air is pushed backward—there is no apparent air foil action. The pictures also show, for the first time, the extreme efficiency of the wing action. At no point during the wing stroke, for instance, is there waste motion. The wing is divided into two parts, with a stiff front half and a trailing half of softer, flexible membrane. After the leading edge of the wing has reached the top or bottom of the stroke, the trailing membrane balloons to give additional stroke power through elastic strength while the leading edge is actually travelling in the opposite direction. END

NEW GOODYEAR RACE COURSE



THE 1948 Goodyear Trophy Race at the Cleveland National Air Races next September will fly a new two-mile, rectangular course within full view of the grandstands.

Legs on the long side of the rectangle will be 4,400 feet long and the ends will be 880 feet. Two mobile pylons will be placed 500 feet from the grandstands so that one end of the course and two of the turns will be directly in front of the spectators.

This new course was decided upon after pilots reported bad winds and turbulent air on the south legs of the 1947 Trophy Race course and spectators objected to half of the race action taking place behind the stands.

The 1948 Trophy Race will be limited to 32 entries determined by eliminations. Eight planes will compete in each of four preliminary heats and the four fastest in each heat will move into the two semi-final races. The eight fastest airplanes will compete in the final race. The second eight will compete for consolation prize money. Total purse is $25,000. Races will be held September 4 to 6.

Wings for the Game Warden

(Continued from page 23)

Game drops thousands of trout into mountain streams, saving time and making fish available in more waters. Oregon agents bag marauding coyotes from the air, and both Idaho and Montana drop tons of salt in remote mountain areas to provide artificial salt licks for wild life.

The Utah department even corrals antelopes with an airplane, later "transplanting" the animals to more favorable sections of the state.

When Maryland's Department of Tidewater Fisheries was harassed by lawbreakers based on the shores of nearby Virginia, a "flying agent" was put into service. By swooping down on violators and collecting evidence before the catch was disposed of, agents have almost eliminated the practice. Louisiana's department operates similarly to detect illegal fishing in Gulf waters. Enforcement has improved more than 100 per cent.

Some of the states, such as California, have a system of air-to-ground liaison. Using two-way radio, the Californians spot violators and radio patrol automobiles which speed to the scene before violators can escape. Nebraska believes its radio system deters potential violators—they never know when an aerial spotter will nab them, even miles from the nearest dwelling.

Among other tasks assigned the aerial game wardens are game and fowl census, seeding waterfowl foods, photography, personnel transportation, timber, estimating, equipment hauling, and detecting and fighting fires in remote areas.

Judging from results already obtained, and from plans now underway in most states, the airplane is one of the big "discoveries" of modern wildlife, fisheries and conservation departments. END

Answers to Do You Know? on Page 64

1. (b) Bank for bank, any plane flying at a slower airspeed turns faster than a plane flying faster.
2. (d) If the wind gradient varies from 10 m.p.h. at ground level to 100 m.p.h. at 20,000 feet, the plane flying into the wind will gain lift as it moves from stratum to stratum.
3. (b) Consult Civil Pilot Training Manual, Bulletin 23, Second Edition, page 20. A non-float glide is several m.p.h. *less* than the maximum distance glide. As depressing the nose decreases the angle of attack, the drag is decreased; therefore, the plane glides farther. In addition, the increased airspeed gives an increased ground speed, offsetting the wind effect.
4. (c) Once in the air mass, both planes offset drift according to the airspeed and wind velocity.
5. (c) A green running light is on the right wing, a red light on the left.
6. (b) Drift angle is the angle between the heading and the track. It is *not* the same number of degrees as the wind correction angle.
7. (c) Diving the airplane to blow the fire out might follow *later*. Cutting the switch and leaning the mixture is also recommended but not in a lightplane, because the prop stops immediately, leaving gas in the lines.
8. (c) CAR provides no restriction on the soloing of aircraft by a private pilot, provided no passengers are carried. But a safe pilot would obtain a check.

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Jets on a Carrier

(Continued from page 20)

aboard ship; they do not accelerate nearly as rapidly from take-off, and they use up virtually the whole flight deck in contrast to the short take-off space required by the propeller-driven shipboard planes. So far, however, the FJ-1s and other jets have made numerous take-offs from Navy carriers without trouble.

Catapults are also available to sling planes off the decks if it should be deemed unwise to have them take off under their own power.

Jet planes land hotter than propeller-driven planes and are not under as good control at slow speed. Nevertheless, many jet fighter pilots say they would prefer jets to conventional fighters for carrier landings because of better visibility. They can see what they are doing better and can use their own judgment to verify the directions of the landing signal officer.

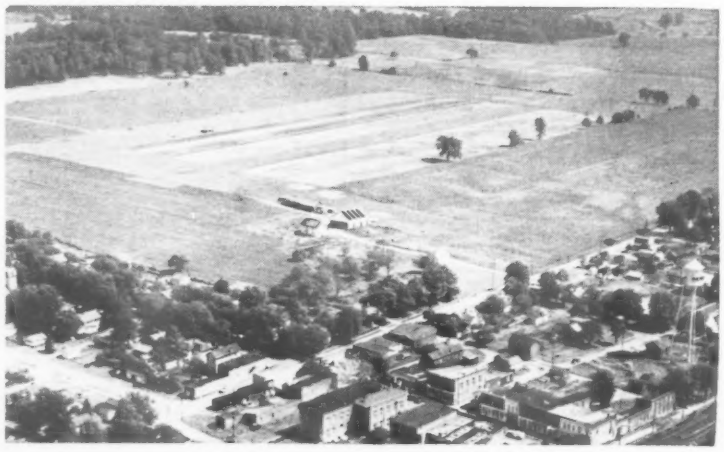
In landing, the planes enter their lineup about 600 feet farther out than is the pattern for conventional carrier planes. They need to be lined up for the signal officer's instructions while still some distance from the deck.

The FJ-1 evaluation tests pictured here were flown by veteran pilots Comdr. Evan P. Aurand and Lieut. Comdr. Robert M. Elder of Squadron Fighting Five Able. They found that their jet planes needed more space in which to accelerate after a wave-off. They also pointed out that wave-offs could be given sooner because of the better visibility from the FJ-1 cockpit.

A new system of deck handling was developed for the FJ-1. Jets are safer in many respects for deck crews because there is no whirling propeller. They are dangerous from the rear for only a short distance directly behind the plane. New nylon barrier cables were installed on the carriers to catch the nose-wheel of the tricycle-geared planes. The nylon cables replaced the heavy metal gear used for over-shot landings.

Take-offs used up 700 feet or more of the 888-foot deck of the *Boxer*. The planes were stationed at the extreme end of the deck and the jets were turned up to their maximum thrust before the brakes were released. The planes took off into a 41-m.p.h. deck wind.

On catapult take-offs, the craft used the 120-foot standard catapult that accelerated the planes to 90 m.p.h. from a standing start. The 12,500-pound fighters showed no tendency to settle after their "sling-shot" take-offs. END



SMALL TOWN AIRFIELD

AN OLD BARN for a hangar and two grass strips behind his store, have made a successful airport for Charles M. Coons, 55-year-old candy-maker and auto supply dealer of the little town of Nevada, O.

His field is so conveniently located it is attracting trade from flying farmers throughout the area. One farmer flies to Nevada to buy his groceries. "If we had more fields like this," he says, "I'd sell my car." Others fly in for a mid-afternoon soda or sundae in Coon's store.

The field has also become the town's main amusement center. The local Lions Club holds its regular luncheons at a shack fixed up on the field, and crowds come out on Sundays just to watch the planes.

The Mail Box

(Continued from page 6)

["My Husband's a Flyer—the Jerk," April FLYING]. . . .

But (I hate to admit it to my husband) . . . *I'm getting the "bug" too!*

MARTHA CRAWFORD LEAR

Hollywood, Calif.

My husband has copies of FLYING dating back to 1933, and if I even touch them there's murder in his eye! . . . Can you send me Mrs. Futch's address? I don't feel quite so alone now.

MRS. RALPH J. CURTIS

Buffalo, N. Y.

Tell her [Janice Futch] to write a book!

ARTHUR R. OTIS

Grand Rapids, Minn.

THE LEDGER SIDE

Your FLYING Check Pilot finished his informative article in the April issue with a thoughtless statement. When a person says he'd rather have his landing gear fold than his fuselage, he means it; he's not using "competitive tactics" as the author assumes.

. . . Have you ever compared the price of a major portion of the fuselage with the price of two landing gear legs?

M. C. MORGAN

Dallas, Tex.

Just *try* to purchase a fuselage cabin section for the price of landing gear and prop —and maybe a wrinkled cowl.

JOHN BOMAN

San Antonio, Tex.

BT-13 BIPLANE CONVERSION

In "Have You Seen?" (April issue) there is a photograph of a BT-13 biplane which was used as a cargo plane. What was done to convert the BT-13 into a cargo plane?

J. T. MILLS

New Orleans, La.

● A stagger decalage wing placement was used in the conversion design which adds to the weight-carrying capacity and also improves stability. With this conversion design an aircraft operator or private pilot could have a dependable aircraft that would carry medium-weight cargo for the price of a lightplane investment. For further information, write R. C. Stroop, c/o W. I. Greenleaf, Jacksonville, Ala.—ED.

QUIT STALLING

I don't think much of the stall-warning indicators. . . .

Why don't they do something to *lower* the cost of aircraft maintenance rather than dreaming up phony devices to sell to the public?

I hope this gives you some idea how many persons feel about so-called safety-devices. Lots of us fly by the seat of our pants, and can fly better that way than by depending on a panel-full of gadgets. . . .

CLARENCE H. OSKEY

Red Wing, Minn.

The Stall Warning Indicator, as I see it, was designed as a *warning* instrument, not

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one to fly by. I can't see why its addition to the cockpit should add confusion.

It's true pilots flew many years without any instruments, but . . . it wasn't because pilots didn't need them; the instruments just weren't made then.

To me, any device is worth $47 if it may someday keep me from breaking my neck.

Austin, Tex. BILL BOWDEN

When the stall is considered seriously enough by all instructors and inspectors, and when this knowledge is properly imparted to students and less experienced pilots, only one problem will exist—that is to prevent the pilot from taking his airplane for granted, and I cannot see that the stall-warning device is the answer. . . .

I feel sure pilots would be safer were they not taught to depend upon an instrument which could, at a most inopportune moment, be unserviceable. . . .

We have not yet entered the era in which a mess of gauges will make it safe for the hopeful who stooges about because he has had eight or 10 hours' dual and never had a fatal accident.

Niagara Falls, Ont. WILLIAM A. SCOTT

THE BLACKJACK

Thanks for your story [Blackjacking the Pilot, May FLYING]. It was about time. On the whole, inspectors in the field are a likeable ordinary bunch of fellows like us but it is the peewee CAA officials who are cappistol Hitlers going around saying "bang bang you're dead bang bang you're dead."

I guess the CAA is getting to be a good deal like Russia because I never thought I could write a letter and have to ask to keep my name quiet, to ask you not to say who wrote it for fear some of the CAA commissars would see it.

T. H. M.

Minneapolis, Minn.

Bouquets to Curtis Fuller for that eye-opener, "Blackjacking the Pilot."

. . . How in hell does one get from one point to the other—LEGALLY?

R. E. SPEAR

Washington, D. C.

I had to laugh at the story of the flying florist who was ruined when CAB suspended his private ticket for something that happened during his student days, thereby stopping his flower delivery service. That's a laugh, especially because they did nothing to him for operating an aircraft for hire. I refer you to Safety Regulation Release No. 265, dated October 8, 1947. Paragraph three states "The use of aircraft to deliver merchandise sold by the salesman would be considered operation for hire." Kick that back to the CAA.

Scott Field, Ill. SGT. DAVID BURNS

• Pilot Ernest Condit did not buy his plane or deliver flowers until after he had his private license. Then he delivered them only to his own business.—ED.

WHAT THIS COUNTRY NEEDS

Since 1939 I have dreamed of owning an airplane but haven't been able—because of high initial cost plus operating costs. . . . Today the cheapest plane you can buy is a *Cub;* and yet, it still costs you a few thousand dollars. . . . If a $1,000-dollar plane were manufactured, I believe more persons would fly and airports would do more business.

Concord, N. Y. JOSEPH SAHAKIAN

• The $1,000 plane is only a dream today; but some prices *are* coming down. The Piper *Vagabond,* for example, sells for $1,990 —$505 less than the *Cub.*

MAP HUNTING

. . . there are undoubtedly other ex-World War II pilots who, like myself, would like to obtain copies of aeronautical charts of the theaters in which they flew.

Where can we obtain the charts?

JAMES R. MANSFIELD, JR.

Bowling Green, Ky.

• Charts can be ordered from U. S. Coast & Geodetic Survey, Department of Commerce, Washington, D. C.—ED.

DEFENDS STINSON'S PERFORMANCE

Reference was made to the amazing difference between factory performance specifications and actual in the article on the "Economy Race" in the AOPA edition of the January issue.

In spite of the embarrassment caused the writer by any reference to this race, he cannot resist stating that, in the light of fair play, this article's mention of the Stinson which consumed 22.2 gallons in 85.7 minutes suggests either a prejudice or careless reporting.

The Stinson referred to is a 1947 - 165-h. p. owned by my father, Charles H. Evoy, navigated during the race by him and piloted by myself.

Neither of us had previously flown in a race and were not aware of the importance

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of the economy feature in this particular race, due in part to the Stinson class having less than 24 hours notice to enter. The excessive gas consumption, therefore, might be attributed to turning the engine at 2,700 r. p. m. for the entire 85.7 minutes instead of 2,200 as practiced by most other Stinson contestants.

Familiarity with only one of the nine airport pylons and a limited experience in navigation caused numerous wanderings and were responsible for that "lost" feeling on several occasions.

My father and I feel that in entering this race so poorly prepared as to show the performance figures published has been unfairly damaging to a very honest airplane. Though we are convinced that no plane in any class flew farther than the accused Stinson, we are also convinced that none flew faster, and the plane is not for sale.

ELVIN A. EVOY

Philadelphia, Pa.

THIS IS PRIVATE FLYING

Mr. Anderson missed one point in "This Is Private Flying": the pay A&E mechanics receive. A&E's in this district work for anything from $30 to $55 a week—and the $55-per-week man is hard to find. . . . Men don't stick to work which requires so much responsibility and knowledge for such small pay.

R. A. VERMILLION

Pittsburgh, Pa.

Perhaps other good maintenance men have done what my husband thinks he must do—find a different kind of work. If all good A&E's go into other jobs to earn more money, then only the poor ones are left to do the type of inferior work Mr. Anderson reports. . . .

MRS. R. W. EDLING

Dallesport, Wash.

George Anderson's story in the April FLYING disturbed me very much. . . .

We have had pilots from all over the U. S., and have never had complaints—but have always had compliments, which encourage us to keep going, as revenue is not sufficient to justify expense of runways and maintenance.

[Anderson's complaint] about our service is bad news. . . . We found that over 70 pilots registered between 9:15 a.m. and 1:50 p.m., when Anderson registered on October 12. For a one-man operation to handle that many planes in one day is quite a job; if there were any men sitting under a plane they were certainly guests. . . . It is customary to gas planes while a guest is dining if he *tells* us he *wants* gas. We do have some pilots who will allow no one to touch their planes, not even allow anyone to touch the props. . . .

PARK ERNSBERGER
Park's Air Park

Norwalk, O.

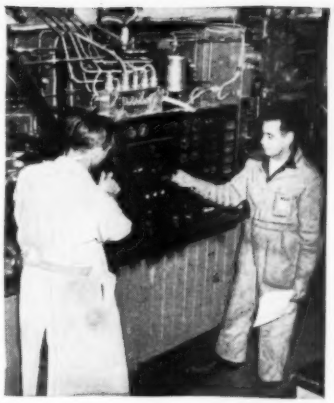
Anderson was directed to the wrong rest room here at Abilene. It was the mechanic's and employee's rest room.

Our customers' rest room is in the Terminal Building and is a clean as any.

AUBRY JOHNSTON

Abilene, Tex.

END



—*Photo by Harold G. Martin*

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AERONCA Chief 1946, 45 hours since major, $1,275. Fred Stanton, 862 North Grand, Mesa, Arizona

1946 AERONCA Chief, 460 hrs. total. Sell for cash, trade for Pick-up or late model automobile. L.S. Wade, Lower Falls Beach, St. Albans, W. Va.

AERONCA Chief late '46, radio 140 hours total time, $1,150. Lee Braxton, Whiteville, North Carolina

BEECH

BEECH-CRAFT Bonanza, Model 35. Total hours 135. Always hangared. All bulletins complied with. All gyro-instruments. Better than new plane. Really just broken in. Write to P.O. Box 887, Tulsa 1, Oklahoma for all details and price

BEECH Bonanza, perfect condition, like new, only 165 hours, will sacrifice. Write for particulars. Don White P.O. Box 1766, Denver 1, Colo.

BEECHCRAFT Bonanza, Blue trim, less than 100 hrs. Excellent condition. First $7500 Takes it.All bulletins complied with. Have purchased a Model "18". Russell Center & Co., San Antonio, Texas, P.O. Box 1521

BEECHCRAFT E17B-285 Jacobs, 5 pass., 10:30 since major & complete re-cover & rebuilt both A&E. Licensed day & night inst. cruises 165-170 on 13 gal/hr. range 900 miles. Perfect in every respect, insurance indluded. Always hangared, looks & flys like new. $5,950. D.C. Johnson, 1173 Desplaines, Des Plaines, Illinois. Phone 1023-M.

BEECHCRAFT D-17-S, Standard Equipment, Fabric good, 800 hours since major overhaul, 1400 hours on aircraft. Box 589, c/o Flying

BEECHCRAFT Bonanza 160 total time, all bulletins complied, periodic inspection, new set platinum point BG plugs, polished, waxed, good as new, will deliver for expenses. $7000. Box 96, Phone 1246, Ada, Oklahoma

BEECH: Bonanza #3133V with 180 hours total time. Relicensed in March ship is very clean, completely equipped, and in excellent condition. Asking $7250. Make offer. No trades. Apply Powers & George, 475 Fifth Ave., New York. N. Y.

BELLANCA

BELLANCA Cruisair: Late 1947. New demonstrator with only 36 total hours. Aeromatic propeller, outside baggage compartment, steerable tail wheel, mufflers, heaters, extra instruments, turn and bank, rate of climb, two-way radio, etc. A deluxe job throughout. Priced right for interested parties. Write, wire or phone. J. W. Stauber, Hylan Airport, Henrietta, New York. Phone: Monroe 4900.

1947 BELLANCA Cruisair, completely equipped. Aero-Matic prop, 2-way radio, Less than 150 hours, just relicensed. Excellent dondition, $4,000 cash. Box 590, c/o Flying

BELLANCA: Cruisair #8775lin new condition. Clean, with 75 hours total time. Relicensed April. Has radio, ADF, primary blind instruments, and Aeromatic propeller. Asking $3900. No trades. Apply Powers & George, 475 Fifth Avenue, New York, N. Y.

BELLANCA Cruisair, 1946, licensed January 1949, less than 200 hrs. since new. Has RC, T&B, artificial horizon, directional gyro, 2-way radio, etc. Deluxe throughout, only $3750. Rudy Hruska, 706 Chestnut, St. Louis, Mo.

CESSNA

1947 CESSNA 140. Total time sixty hours. Always hangared, never damaged. Price $2600. Barbara Scofield, Poplar Bluff, Mo.

TWIN Engine Cessna 1942 Model, heavy wing; (spar repairs unnecessary when converted); constant speed propellers; fully recovered wings and fuselage, seats reupholstered when converted, needs top and side wall upholstery, fully equipped for instrument day and night flight, flourescent cockpit lighting, passing light in nose, two generators, large storage battery, baggage compartment with outside door, aircraft 1295 hours since manufactured, 481 sinceconverted, engines 980 hours since new, 255 hours since major overhaul, price $3250 net, will finance reasonable portion to responsible party, hangared near Washington. P.O. Box 38, Brentwood, Md.

CESSNA 120 radio, heater, 50 hrs. on engine, licensed to Feb., 1949, $1850. Warren Johnson, Nottingham, Pa.

CESSNA 140, landing and navigation lights, two way radio, 180 total, always hangared, $2300. L.B. Howard, Box 386, Daisetta, Texas

1947 CESSNA 120 Seaplane. Ideal for individual or flying club, for pleasure or profit at lake resorts, seashore, etc. Equipped with Edo Floats, Electric Starter, Navigation Lights, McCauley Metal Prop. Clean ship, handles beautifully, less than 100 hours, licensed to August, 1948. $3,500. George Dressner, 86 Fort Washington Avenue, New York 32, N. Y.

TWIN-CESSNA, heavy wing, executive interior, ADF, engines 150 SOH, $5,000, will trade for Stinson or Navion. Wilbur L. Paris, Bowman Field, Louisville, Ky.

CESSNA T-50: Deluxe conversion, recovered 8 months ago, interior by Allmon, ADF, total time since conversion 194 hrs. Price $3850. Wings Field, Inc., Ambler, Pa.

1947 CESSNA 140 guaranteed to look like new. 19 hours total. Metal prop. Blind flight group, heater, Safe flight indicator, two-way radio. It cost $4000. Sensational offer, $2785. A.A. Chessmore, Atwood, Kansas

TWIN Cessna UC-78; Total time since new only 560 hours. Manufactured 1944. Deluxe job throughout. Hand-rubbed dark green finish with cream trim. Cabin Fiberglas soundproofed and upholstered in two-tone tan and brown, all like new. Floor raised, battery under co-pilot's seat, radio in nose, etc. Outside baggage door, extra 30 gal. tank, heavy wing, constant speed props. Always hangared, never damaged in any way. Privately owned and flown, and maintained in absolutely top condition. Really must be seen to be appreciated. Licensed, day, night and instrument. First cash offer over $3500, or will consider light, side by side plane, plus cash, intrade. L. W. Rittenhouse, Honeoye Falls,N.Y.

CESSNA: 140 #90330. Flown 92 hours and in new condition with primary blind instruments. Two-way G.E. radio, and retractible landing light. Asking $2000. Offers considered. No trades. Apply Powers & George, 475 Fifth Avenue, New York, N. Y.

CESSNA T-50: 195 hours since major, heavy wing, 150 gallon gas capacity, relicensed July, Price $2500. Wings Field, Inc., Ambler, Pa.

CULVER

CULVER V 119 hours. Licensed to Sept. $1695 or trade. K. Van Ausdal, 303 S. 23, Richmond, Ind.

1941 CULVER. 80 Franklin, 494:50 total 144:20 since major. Two-Way radio. Excellent condition. Cruise 125 on 5 GPH. Unequaled for economical X-C. $1600. John Fickler, Coudersport, Pa.

ERCOUPE

LATE 1946 Ercoupe #N C 2118H latest Tab, Tanks, Bendix Radio Receiver, Sensitive Altimeter, Starter, Generator, always hangared, never scratched, just relicensed in Nov., 1947, 65 hrs. flying time. Price $2200. Herman Seavers, Hershey Air Port, Hershey, Pa.

1946 ERCOUPE: 125 hrs., two-way radio, Ship in good condition. Sacrifice for best offer around $1800. Must sell. Dr. Richard Page, 307 Quaker Road, Chappaqua, N. Y.

ERCOUPE. Latest model, 1946. 12 actual hours, all XC, since new. In hangar storage one year. Never damaged. Guarantee same as new, $2395. Deliver Free anywhere USA. J.R. Cunningham, 4538 Warwick, Kansas City, Mo.

ERCOUPE. Late 1946, total time 50 hours, always hangared, never damaged. All bulletins complied with, exceptionally clean ship, Privately owned.$2000, or will accept new car in trade. Box 424, Portsmouth, N.H.

ERCOUPE 130 hours since new. Radio, Skis, Gyro Compass, sensitive altimeter, McCauley Prop. Just had 100 hour check. A real buy. A. Mueller, 1405 Orchard St., Des Plaines, Ill

ERCOUPE, Deluxe, 95 hours, Metal Prop, two-way Radio, Direction Gyro, Sensitive Altimeter, Cruises five miles faster than ordinary Ercoupe. Asking $2100. J.K. King, Box 318, New Rochelle, N. Y.

ERCOUPE late 1946 in excellent condition. Always privately owned and hangared. 85 hours total time. Licensed to August '48. Never damaged. Sensitive altimeter clock, starter, Generator, etc., $2000. J.W. Faries, Smyrna, Delaware.

ERCOUPE, 1946, less than 100 hrs. every C.A.A. and Factory requirement complied with, always hangared, never scratched, perfect condition, 2 way G.E. Radio, sensitive Altimeter, new gas tanks, will guarantee this plane to be in better condition than when I bought it, am the original owner. $2,150. Ralph L. Clark, Rt. 2, Box 427, Lodi, Calif.

MOVING to Alaska. Must sell new '47 Ercoupe with only three hours ferry. Will deliver from East coast for expenses. Box 591, c/o Flying

1946 ERCOUPE. 50 hours, relicensed. All bulletins complied with, starter, generator, battery, lights, $1975. John Cunha, 26 Howe Street, Methuen, Mass.

ERCOUPE 1946 (stored) starter & navigation lights. Less than 40 hrs. First $1500 takes it. Dr. O.R. Clovis, 336 McKinley Ave., N., Canton, Ohio

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FAIRCHILD PT-23, 185 total hours, ship completely recovered. No hours since relicense, Rawdon Hatch, two-way radio, 12 volt battery. Blind flight instruments. Make me an offer. Charles Mahaffey, 427 Blackhawk St. Aurora, Ill.

PT19A PERFECT condition just relicensed, always hangared, want to trade for Cub or Aeronca. Bruce Cogle Jr., Thomasville, Ala.

FAIRCHILD M62A: Sliding hatch, equipped as instrument trainer including interphone system, transmitter, two receivers, manufactured in 1944. Price $1195. Wings Field, Inc., Ambler, Pa.

FAIRCHILD PT-19A, NC55405, 420 hours since major, 10 hours since relicense. Always hangared. Excellent condition. $1000. John A. Davey, 81 Berkley Street, Providence, R. I.

FAIRCHILD PT-26, 100 hours total since new. Electric starter, new generator, new tires, covered wings, special leather cushions, CO2 system, full instruments both cockpits, yellow with black stripe, inter-com, excellent condition, asking $1,850. Consider best offer or trade 1948 auto. F.H. Whaley, Box #2, Westport, Conn.

PT-23: HANGARED at Westfield Flying Service at Salem, Illinois. They're relicensed at a cost of $675. Add $250 and take it away. Only 235 hrs. total on A&E. Rudy Hruska, 706 Chestnut St., St. Louis, Mo.

FAIRCHILD 24R, 1946 model, 4-place. General Electric radio, landing lights, flares, never cracked always hangared. 450 hours total, 100 hours since overhaul. Cost $6800 a little over a year ago. Our price $3495. Fly boys and girls here's a buy. Vest Aircraft Co., 4600 Dahlia, Denver, Colorado.

GLOBE

GLOBE: Swift 125 #81665 with only 85 hours total time, Aeromatic propeller, and G.E. two-way radio. Excellent clean condition in Pennsylvania. Asking $2750. Make offer. No trades. Apply Powers & George, 475 Fifth Ave., New York, N. Y.

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GRUMMAN Widgeon. 1030 hours. 110 hours on new engines. No time since relicensing. Hangared. Included spare engines 399 and 411 hours since major. Ted Blaisdell, 1052 Grove St., Framingham, Mass.

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HOWARD 15-P-4 place 91 hrs. on new engine, 104 hrs. since major, recover, licensed to April 21st 1949, night, day, instruments, $4000. Will take good AT6 in trade. E. B. Jeffress, Ashville, N. Y. R.D. #1

HOWARD with 450 P&W Engine 387 since OH. Licensed to Sept. 48. Beautiful cream & blue. 4 individual chairs. Worth $5,000. Sell $2,495. A. Rudy Hruska, 706 Chestnut, St. Louis, Mo.

HOWARD DGA15P. 302 hrs. Beautiful waxed blue and cream. Can show at fields in middle Atlantic area. $3550. Ferguson, 1321 New York Ave., Cape May, N. J

NOORDUYN

NOORDUYN Norseman: Three excellent condition, Low time. Hangared. Blue and yellow, $5,000 each or $13,500 for three. Traylor Aviation Company, 1707 N. Street, N. W., Washington, D.C.

NORTH AMERICAN

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NORTH American: Navions. 4 excellent 1946-47 airplanes available from $5200 up, depending on total time add equipment. Owners want offers. No trades. For complete details and inspections apply Powers & George, 475 Fifth Avenue, New York, N.Y.

LUSCOMBE

WILL trade for new Chevrolet or Plymouth sedan my 1946 Luscombe Silverair, total 40 hours, hangared never damaged. T.R. Lamb, 861 Granby St., Norfolk, Va.

LUSCOMBE 8-A, 65 Cont., Mfg. Aug. 1946, actual total of less than 90 hours, all X.C., owned and flown by commercial A&E, always hangared, never damaged. My Luscombe can hardly be told from new. $1550. Forest Rippee, 526 S.W. 29 Street, Oklahoma City, Okla. Phone 6-5404

PIPER

SPECIAL Offer. Dandy 1947 Cub Cruiser with all equipment. Radio. Price, $2475. Always privately owned and hangared. Must sell at once. Write Robert Johnson, Greenwood, Wis.

SUPER Cruiser, 47, total time 93 hrs., all bulletins complied with, 100 hr. check and relicensed. Two way radio, always hangared, never cracked, like new. Sacrifice, $2800. Charles J. Wendel, 3325 Buffalo Road, Wesleyville, Pa. Phone Erie, Pa. 86-210

46, J3, CLEAN, under 200 hrs., always hangared, quick sale to best bid. Donald Duncan, Phone W62X, Clarinda, Iowa

J2 CUB licensed. Fabrid, prop. etc. 1 year old. 30 hrs. since O.H. total time 520. Hangared, never cracked up. $600. Write for information. C. Milens, 42 Myers Ave., Denville, N. J.

1947 SUPER Cruiser, total time 100 hours with Sensitive Altimeter, Manifold Pressure Guage, Turn and Bank Indicator, 2 way Radio, Sensenich Controllable and Sensencih fixed pitch props. Privately owned. Just relicensed. A-1 condition. Never damaged. Always hangared. Make an offer. No trades. M.A. Whetstone, 239 E. Division St., Kewanee, Ill.

1947 PIPER Super Cruiser. Only 70 hrs. Always hangared, like new. Just relicensed. Two way radio, $2700. James Clow, Plainfield, Ill.

CUB, 1941 J-3, 35 hours since major, privately owned, sacrifice at $595. W.C. Edwards, Jr., Eastman, Ga.

PIPER Super Cruiser, January, 1947. Less than 25 hrs. Gierston Tool Co., Inc., 326 East Water Street, Elmira, N. Y.

PORTERFIELD

PORTERFIELD. For sale. Bargain, Model 35.70, built, 1936. Total time on engine 420 hrs. since new. Needs some repair unlisent. Will sell as is for $300 or will trade for motorcycle. Write Box 64, Manchester, Conn.

PORTERFIELD LP-65. Just relicensed. New fabric. Perfect condition. $725. E.M. Huston, Windsor, Mo.

REPUBLIC

SEABEE. Serial 841. Less than 100 hours, just relicensed, complete with all latest bulletins and two-way radio. Asking $3350 but will accept best offer as must sell. H.J.R., 26 W. 47th St., New York 19, N. Y.

SEABEE at sacrifice, new last summer 1947. Major check recently from stem to stern. Like new with exception of flight to Florida and return. Never damaged. Deluxe equipment, cross country instrument, gyro compass, radio transmitter and receiver, wing landing lights etc. Price $5000 or highest bidder for quick deal. L.M. Bingham, Lincoln, Ill.

47 SEABEE, annual just finished, all bulletins complied with. 135 hours, never cracked, $4250. Will deliver anywhere for expenses. Box 196, Palm Harbor, Fla.

SEABEE: 128 hours total, excellent condition, now stored and pickled, price, $3950. Wings Field, Inc., Ambler, Pa.

SEABEE: Late model, serial No. 711. NC64060K, only 90 hours total time, always hangared, excellent condition. Make offer, Harold Tracy, Brown Ave., Norwich, New York.

SEABEE: Demonstrator, only 21 hours total time, equivalent to new, now stored and pickled. Price $4500. Wings Field, Inc., Ambler, Pa.

STINSON

STINSON 10-A, 100 hrs., since factory major. Superior condition. Navy instruments, $1500. Orrin Deuel, Fashion Store, Eau Claire, Wis.

1947 STINSON Voyager 165, 333 hours, clock and all instruments, wheel pants, majored, 100 hr. inspection, relicensed, waxed. Never cracked privately owned by instructor pilot. New condition. $4600. Bryant L. Smick, Box 184, St. John, Washington

STINSON 150 Voyager. Late 1946 Model, 180 hours since new. Used for business trips only. Always hangared and no crashes. Has sensitive instruments and two-way GE radio. $3800. Bisher Hardwood Lumber Co., Tuscaloosa, Alabama

EXCEPTIONAL 1946 BC-12-D. Stunning three color custom paint job. Unusual performance, cruises 110. Completely equipped. $3700 total investment, sacrifice for $2600. Write for details. 1945 Concord Road, Columbus, Ohio

STINSON L-5. Handsomely painted in red and silver. Fully equipped for night flying. Electric starter. New two-way radio, tires, tail wheel, battery. In excellent condition, hangared. $1400. F. Q. Hershey, Box 58, RFD2, Rochester, Michigan, Phone 4608

STINSON: 165 #372C. Brand new. 8 hours ferry time only. Primary blind panel and two-way radio. Near New York. Will sacrifice at $5000. Make offer. No trades. Apply Powers & George, 475 Fifth Avenue, New York, N. Y.

1947 STINSON 'Voyager', 103 hours., Aeromatic Prop. A nice clean Airplane, never cracked and always hangared. Preston Motor Sales, Oneonta, N. Y.

1947 STINSON 150: Primary group plus D.G., manifold pressure, outside baggage, two-way radio, amber polaroid and goggles, 250 total hours. Will take two Cessna 140's or Super Cruisers on even trade. Lowman Flying Service, Leesburg, Indiana

TAYLORCRAFT

TAYLORCRAFT, 1946 model BC-12-D deluxe, total time 78 hrs., on A&E. Mettalic blue and silver. Perfect condition, never scratched, wing tanks and receiver. Sacrifice for only $1500. Contact Bob Matthews, 1833 E. Dewal St., Apt. #9, Jacksonville, Fla. or Dell Popwell, c/o Florida Air Service, Herlong Field, Jacksonville, Fla.

TAYLORCRAFT 2 PCLM. 560 hours. Licensed July, 1948. Turn-bank indicator, Skiis. Lights. Wind generator. New battery. Very good condition. Will sell at sacrifice. Russell S. Bergh, Middleburgh, N. Y.

1938 TAYLORCRAFT (A-40) NC20543. Recovered 10/15/46. Recent major. Hangared. $800. C. Wheeler, P.O. Box 165, Waltham 54, Mass.

VULTEE

SNV-1 JUST licensed night instrument. Radio licensed, constant speed prop, all metal, 280 hours since overhaul, 1000 since new on engine. $1000. Charles W. Post, Harriman, N. Y.

VULTEE Surplus. BT-13's with 450 h.p. engines low time unlicensed, $250 up. Licensed, $495 up. Cruise 140 mph. A. Rudy Hruska, 706 Chestnut, St. Louis, Mo.

MISCELLANEOUS

1947 STINSON Voyager 150, 1946 Aeronca Champion, 1943 Piper 100 h.p. cruiser (converted AE-1), 1946 Cessna 140 for best offers. Swanson Aero Service, Sycamore Airport, Sycamore, Ill

AIRPLANES. Send for free list. All makes & models, World's largest stock and lowest prices. It's easy to buy from us, we do everything for you except pay for the airplane. Vest Aircraft Co., 4600 Dahlia, Denver, Colorado

AIRPLANES WANTED

PACKARD Dealer will trade new 1947 Packard Custom Eight 7 passenger Sedan for Navion or Bonanza. Black car with tan trim. Has radio, front and rear underseat heaters, dual defrosters, overdrive and electromatic clutch. List price, delivered includes taxes, accessories, transportation and license plates, $5165. This is a showroom car, which has never been licensed or used. Burdette Olson Motor Co., 478 W. Michigan Ave., Kalamazoo, Michigan. Phone 9668

PARTS AND ACCESSORIES

AIRCRAFT Phone Transmitter, Maguire ART-1-3105 Kcs. crystal controlled, 8 watts output, total weight including built-in power supply only 10 3/4 pounds, operates on 12 volts DC. $69 each FOB, Globe Products Corp., P.O. Box 7, Bridgeport, Conn.

UC-78 12.50 TIRES, brand new; $6.50 each, 3 for $15. Aero Instrument Co., Municipal Airport, Houston Texas.

PHENOLIC Tubing, (spagetti), 100 feet .160 size, $2.25. Brand new BT dynamotor, 24V, $5.95, 5 for $25. Mallory noise filters, N1-1, new, dozen, $12. ADF (SCR-269G or F) loop cords(with 2 PL108 plugs), dozen, $12. Aero Instrument Co., Municipal Airport, Houston, Texas

FOR Sale: Late type Wright used engine cylinders for J540-760 or 970; less than .003 taper, $15 each or 7 for $80. Saunders Motor Company, Longview, Wash.

A $200,000 INVENTORY of unused aircraft parts consisting of fuel indicators, solenoid assemblies, selector switches, hydraulic pressure switches, flap position indicators, Selsyn TJ-11 transmitters, regulating vacuum valves, etc; full price: $2,000. For description and quantitites write Box 587, c/o Flying.

PRATT & Whitney 450 hp Wasp R-985 owners attention. We have almost new parts for these engines. Contact us for valves, cylinders, cases, rocker arms, pistons, rods, crank-shafts, etc. Arkansas Aviation Service, Grider Field, Pine Bluff, Arkansas

NAVION Owners. Add 10% to your cruising speed and range at no increase in power or fuel, install a CAA approved Tennes Navion Landing Gear Fairing Kit. Specify Hayes or Firestone wheel with order. Six hours installation time at any A&E shop. Net wright 8 lbs. Retail price, $130. Installation Extra. H.E. Tennes, 801 Burlington Ave., Downers Grover Ill.

PROPELLER: Sensenich 70D42, never used, $35. John Urban, 224 Sullivan St., New York, N. Y.

BT-13 HAMILTON Standard propellers, reconditioned, like new, complete. Crated $85. Other propellers, blades, parts. Wearth Aircraft Sales, 5216 Wabash, Kansas City, 4, Missouri

CONT. A65 Props. New, $24 each three or more. Singles $30 each. CAA approved for Taylorcraft, Cub, Aeronca etc. Just right for GI programs. 72C43 excellent take off, good cruise. Made by U.S. Propeller Co., Available for either Flanged or Tapered shaft. Payment with order please, no C.O.D.'s, Air Stations, Inc., P.O. Box 228, Compton, Calif.

SNAP Vents $1 pair. Booster coils, works on 6-12 or 24 volt, new, $3.50. Range filters FL-8-A, new $2.50. Messy, 3786 W. 116, Cleveland, Ohio

E6B COMPUTERS; steel construction, leather case, Used buy good. $45 per dozen; $5 apiece, postpaid. Southwest Supply, Sanderson, Texas

BATTERIES AN3141, $20 each. New dry charged, 17 Amp. hour, 24 volt. 4 Batteries, $75. packed in original box. J.W. Shelton, Box 1262, Tulsa, Okla.

AVIATION EQUIPMENT

COMPUTERS, Dalton Model G, which straps to the leg, leaving one hand free, (formerly sold for $50, now only $7.50; Rolaire deluxe map cases for safe, easy pilotage, $14.95; AAF-type A-2 computer, $2; Weems plotter $2; New Model C. American Airlines computer in leather case, with instructions, $5; E-6B Army computer, most widely-used computer in aviation, $10 (with leather case & instructions); and from our large war surplus stock; Army D-12 aperiodic compasses for aircraft, airports and marine vessels, $12.50; astrocompasses, with instructions, new, only $12.50; Longines pocket compasses for sport or work, new, $1.20; Dietzgen 6-inch protractors 20¢; Elgin pocket stopwatches, like new, $12.75; Bausch & Lomb sextants, $32.50; like new F-8 aerial cameras, a "best buy of the month" at $175; Dealer agencies open. (Free Catalogue.) Pan American Navigation Service, Dept. F-1, 12021 Ventura Blvd., N. Hollywood, Calif.

SUN Glasses. Air Corps type, gold plated frame, pearlized brow bar, regulation case, $2.98. 30% discount in dozen lots plus counter display. C. & G. Air Supply, Box 203, St. Paul 2, Minn.

NEW K-1 summer flying suits made of durable byrdcloth with ninezippered pockets, $10. R.A.F. Manufacturing Company, 6 East Lake St., Chicago 1, Illinois. Buy direct and save.

SELLING out 5,000 pairs genuine gold plated sunglassed with pearl sweatbar at $2.75. 25% discount allowed on dozen lots. Beautiful, modern display cabinet will be shipped free of charge with orders for two dozen glasses or more, if desired. R.A.F. Sales Company, 6 East Lake St., Chicago 1, Illinois. Louis Naparty, sales manager

HELMETS. New, ANH-15, AAF light weight tan gabardine with sponge rubber earcups $1. A-11, AAF, kidskin leather, sponge rubber earcups $3.45. Sun-Dodger Flying Cap, khaki or O.D. twill, long visor $1.15. State size. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

FLYING Suits. New, L1 olive drab wool gabardine, 9 zippers, medium size only, $12. K1 tan byrd cloth, light weight, 9 zippers, all sizes $10. Mae West Life Jackets less CO2 Cartridge $4. Cartridges .25¢ each. Scarfs, white Nylon, 66"x18", $1.95. Gloves, B3A, AAF, new, summer Flying Gloves, dark brown genuine kidskin Leather with take-up elastic inside wrist, all sizes, $2.95. Same glove in Buckskin, $3.95. G.I. Gloves, Army, khaki wool, leather palm, $1.95. State size. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

PILOTS License case, P1 genuine Morocco Leather, six windows, $2.50. P2, Sheepskin leather, black, $1.25. Wallets, genuine brown Calf or tan Saddle leather, the finest, $4.50. To above items add 20% excise tax. Aircraft Inspection Flashlight, with long adjustable nozzle $1.50. Gold stamping; names stamped on leather strip. One line 65¢. Two lines $1 (No C.O.D.'s on stamping). Many other items. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Illinois.

BATTERIES & Tires: new for all types of Aircraft. Also tubes. Send for free list. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

NEW A-2 type flight jackets made of the finest horsehide. Zippered fly front, elastic knit cuffs and waistband with cloth lining and roomy snap pockets. Regular sizes priced at $19.95. For big men, sizes 48-50, priced at $20.95. R.A.F. Manufacturing Company, 6 East Lake St., Chicago 1, Illinois. Buy direct and save.

NEW A-2 type flight jackets with genuine Mouton fur collar. Body made of the finest front quarter horsehide. Sizes 36-46 priced at $20.95, R.A.F. Manufacturing Company, 6 East Lake St., Chicago 1, Illinois. Buy Direct and save.

NEW B-15 type jackets made of durable O.D. cloth. Alpaca lined, elastic knit cuffs and waistband with genuine Mouton fur collar. All sizes, special at $10.50. R.A.F. Manufacturing Company, 6 East Lake St., Chicago 1, Illinois. Buy direct and save.

ALL wool gabardine L-1 flying suits, nine zippered pockets. Sizes medium-regular and medium-long. While they last $8.95. R.A.F. Manufacturing Company, 6 East Lake St., Chicago 1, Illinois. Buy direct and save.

SUNGLASSES. Airforce type, gold plated rims, pearloid nose pieces and sweat bar. Life time guarantee against breakage $2.49 Joseph Scialfa, 315 Chelsea Ave., Long Branch, New Jersey

AAF FLYING suits, tan byrd cloth, zippered, $6.95 Mae West Life Jackets with CO2 cartridges, $2.75 B-6 Sheepskin Helmet, S-M-L $1.95, "Genuine" B-15 Jacket $14.95, Fischer Flying Goggles clear lens, $3.95 (AN6530), Free catalog. Brunal Supply Co., 114 E. Edgar Rd., Linden, N.J. All new Mdse.

TIRES, new, for all types of Aircraft. 5.00x4, $7; 6.00x6, $9; 8.00x4, $9; 6.50x10, $9; 7.00x6, $9.50; 7.50x10, $9; 8.50x10, $9.50; 8.90-12.50, $8.75; 11.00x12, $17.50; 26x6, $12; 1600x16, $27.50; 17.00x16, $52; 17.00x20, $27.50; 34x9-9.00x16, $19.50; 27", $9.95, 30" $12.95; 33", $15; 44", $37.50; 47", $30; 56" - $37.50. Tail wheel sizes 6.00x2 solid $1.25; 8.00 $4; 10.00, $5; 12.50, $7; 12.50x4½ $6; 14 1/2x4 1/2, $5.95; 9.00x6, $9.75; 10.00x7, $9.75; 10x3, $4.50. Tubes available also. Send for complete list. Flying Equipment Co., Dept. F, 1639-45 W. Wolfram St., Chicago 13, Ill.

BATTERIES: new, for all types of Aircraft. AN3150, heavy duty, 24V 34 Amps. $27 dry. Fits UC78, Cessna, P38, etc. AN3151, 24V 17 Amps. Shielded, $22 dry. Fits AT7, AT11, Twin Beech, T50 Cessna, etc. AN3152, 12V 34 Amps $12 dry. Fits AT19, Stinson, BT13, PT23, & T50 Cessna, etc. NAF1062-17, smaller, 12V 17 Amps $17 dry Fits L3, L5, PT19, etc. TPWS-13-16 12V 63 Amps. $47.50 dry. Fits BT13 & AT6 D88-Heavy duty, 12V 89Amps. $50 dry. Fits DC3, C47, Conestoga, etc. AW-1225 12V 24 Amps. $29.85 dry. Fits Cub Cruiser, Luscombe SKY-6V, 10 Amps. Wt 8#, $14.95 dry. Fits Piper Cubs. Add $4 for charging. Cannon quick-disconnects, available for AN series at $3.50. Flying Equipment Co., 1641- 5W. Wolfram St., Dept. F, Chicago 13, Illinois

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ANJ-NAVY Winter Flight Jacket, Genuine, new, dark brown sheepskin lined leather, large shearling collar, zippered. Sizes 38-44-46 only $29.50. ANJ-Navy Winter Flight Trousers to match $12 per Sizes 34 to 48. Flying Equipment Co., 1639-45 W. Wolfram St., Dept. F, Chicago 13, Ill.

HELMETS-A-11 AAF kidskin leather with sponge rubber earcups, $3.45 AMH-15 tan byrd cloth, sponge rubber earcups, summer type $1. Sun Dodger Flying cap, khaki or olive drab twill, long visor $1.15. B2 Pilot Cap, sheepskin lined dark brown leather, long visor, ear laps, $3.75. Flying Equipment Co., 1639-45 W. Wolfram St., Dept. F, Chicago 13, Ill.

RAY-BAN Sun glasses; Original, made by Bausch & Lomb, gold filled frames, ladies or gents, $7.95, with Sweat-bar $10.95, Shooting Glasses $13 pr. Pilot License Cases-P1 Genuine Morocco Leather, six windows $2.50, P2-Sheepskin leather, black, $1.25. Add 20% excise tax to license cases. Gloves-B3A AAF summer Flying Gloves, dark brown unlined genuine kidskin leather, all sizes, $2.95, G1 Gloves, khaki wool with leather palms, $1.95. Navy Pilot Gauntlet, dark brown goatskin leather, baby lamb lined, one finger mitten type, $ 7.95. Regular wool knit glove, brown or maroon, $.95. Scarfs, white Nylon, 66"x18", $1.95. Gold stamping, name on leather strip, one line $.65, two lines, $1. Send for free list. Flying Equipment Co., 1639-45 W. Wolfram St., Dept. F, Chicago 13, Ill.

HALLICRAFTER Skyfone Transceiver, Model CA-4, weight 7#-14 oz. Same set as used in latest Seabee. Brand new, $50 each, f.o.b. Chicago. A bargain, Headset $3.50. Microphone $6.95. Flying Equipment Co., 1641-5 W. Wolfram St., Chicago 13, Ill. (Dept. F.)

SOLDERING Irons, new, $2.45, 24 Volt, 100 Watts. For battery cart or ship power supply. J.W. Shelton, Box 1262, Tulsa, Okla.

NEW Navy Surplus leather flight helmet NAF 1092 chamois lined, $3. New N2 Polaroid pilot goggles with extra lenses, $3. New Army A10 leather flight glove, lined, $3. New Army B-3-A kid leather flight gloves, $3.50. Pilot Map Case with your name in gold letters, $2. Full line of Army and Navy jackets, etc. Send 25¢ for catalog of over 100 amazing values. Join our 10% club, $1. Members entitled to 10% discount on all items. Postage prepaid on cash orders. Satisfaction guaranteed. Pollock's Gov't Surplus, 6077 Van Nuys Blvd., Van Nuys, Calif.

GENUINE Navy intermediate Flight Jacket, new, dark brown goatskin leather, mouton fur collar, bi-swing back, celanese lined, zippered, elastic-knit waistband and cuffs, size 34 to 48, $35. A2 Flight Jacket new, Army type, select dark brown horsehide leather, cloth lined, zippered, elastic-knit waistband and cuffs, size 34 to 44, $18.75. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. F, Chicago 13, Ill.

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ATTENTION: G.I. Operators, you are permitted under your contract to specify Zweng publications when required or desirable. The law does not compell you to accept a particular text. Zweng publications have over a period of years lessened the burden imposed on the Operator and Ground instructor. Discounts are above average. Many of the alert Veteran Approved schools now specify Zweng publications, Viz; Aeronautical Training,(commercial and Private Pilot Rating) $3; Meterology for Airmen, $3; Ratio and Instrument Flying, $4; Aeronautical Navigation, $3; (to replace Bulletin #24 out of print). Flight Instructor, $3; Link Instructor, $4; Airline Transport Pilot, $4; Civil Air Regulations for Pilots, $1; Aircraft and Engine Mechanic, $3; Flight Engineer, $4; Parachute Technician, $3. (Write for catalog with discounts). Pan American Navigation Service, 12021-F2, N. Hollywood, Calif.

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FLIGHT Engineers: Charles A. Zweng's new "Flight Engineers Manual" contains typical examination questions & answers for flight engineer rating, $4, postpaid or C.O.D. Pan American Navigation Service, Dept. F-1, 12021 Ventura Blvd., N. Hollywood, Calif.

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NOTICE. Bulletin 24 is no longer being printed by the government. Operators can specify "Aeronautical Navigation" by Charles A. Zweng. $3 list. Discounts to Dealers. Outstanding G.I. approved schools are using Zweng texts. (Free Catalog) Pan American Navigation Service, 12021-A9, N. Hollywood, Calif.

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COMPLETE private, commercial and flight instructor courses offered veterans and private students. Write. School of Aeronautics, Gridley Airport, Ypsilanti, Mich.

COMMERCIAL Student Pilots: A new study book written for the new Commercial Pilot exam. Questions and answers on Regulations, Navigation, Meterology, Aircraft and Theory, and Engines. Printed easy to read, 200 pages, digest size, $2.50. Official "World Air Chart" included free. Money back guarantee. Also Private, $1, Flight Instructor, $2, Navig-Aid (Cross-Country Planner) $1. C.O.D. or postpaid. Hangar Flying, Dept 1D7, 112 E. Grove, Bloomington, Illinois

SAMPLE Commercial Exam. Complete quiz, 30 questions and answers on each part, regulations, navigations, meteorology, aircraft and theory, engines. Similar to CAA written. 50¢ cash, no stamps, No C.O.D. Money back guarantee. Hangar Flying, Dept. 1G7, 112 E. Grove, Bloomington, Ill.

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AIRLINE Jobs. Recent survey of airline employment opportunities tells you what jobs there are, and how to get them. Qualifications, salaries. Where to apply. $1. Christopher Publications, Dept. C-7, Box 111, Holtsville, N. Y.

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SITUATIONS WANTED

GRADUATE of Spartan's School of Weather wants work. P. O. Box 135, Lenoir City, Tenn

FORMER Army pilot, age 28, single, desires position with reliable concern. Commercial license, single & multi engine. Go anywhere. Business and mechanical background. 1 year college. Excellent references. Will consider and answer all offers. Box 586, c/o Flying.

MISCELLANEOUS

SUN Glasses. Air Corps type, gold plated frame, pearlized brow bar, regulation case, $2.98. 30% discount in dozen lots plus counter display. C. & G. Air Supply, Box 203, St. Paul 2, Minn.

AIRCRAFT Photos World War I. 2 3/4x4 1/2. Send 10 cents for catalog and photo. Aircraft Photos, 2901 Milwaukee Ave., Chicago 18, Ill.

LEATHER Name Patches gold stamped, with Military or Civilian wings, $1, 3 for $2. Clubs, Schools, any design. Julie's Leathercraft, Lone Tree, Iowa.

LEATHER Insignias made to order. Send sketch or design. Satisfaction guaranteed. Julie's Leathercraft, Lone Tree, Iowa.

WANTED. Fairchild K-20 Camera films, black & white, colored. Pneumatic Wheels 10" overhall diam. One horsepower electric motors 110-220 volts 60 or 25 cycles, double end shafts 2300 RPM. Eastern Aviation, P.O. Box 402, Upper Town, Quebec, P. Q.

"84 CARD Tricks," 25¢. "Police Ju-Jitsu." 50¢. "Scientific Boxing," 50¢. Free catalogs. Hirsch, Spring Valley 14, N. Y.

AIRCRAFT Photographs. Sample photo and illustrated 52-page catalogue listing nearly 5000 aircraft from World War I and II. 25¢. Aeroplane Photo Supply, Box 195, Toronto, Canada.

PARACHUTES: Aired, repaired, drop tested, repacked in government approved loft. Prompt service. Limited number unused surplus parachutes, still in manufacturers boxes. Shipped freshly aired and repacked. Authorized Pioneer Parachute dealer. Write for prices. Melanson Parachute Service, Box 240, Lake Charles, La.

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AM flying Cub to Minneapolis July vacation. Wish companion share expenses. All replys answered. O.A. Steen, 401 W. 95th St., Los Angeles, Calif. Plymouth 51320.

PATENTS

INVENTORS. When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure Patents or Trademarks. Write Patrick D. Beavers (Formerly Randolph & Beavers). Registered Patent Attorney, 912 Columbian Bldg., Washington 1, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 218 Columbian Bldg., Washington 1, D. C.

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AIRPORT for rent: Ideal set up for instructor A&E combination. 8 plane hangar, insulated 2 plane shop and office building, oil heated. Liberty Aero Ass'n., Sutherland, Iowa.

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WOULD you pay 3% first $350 made? Color illustrated book "505 Odd, Successful Enterprises" free. Some offer occasional day off. Work home. Expect something odd. Pacific 49, Oceanside, Calif.

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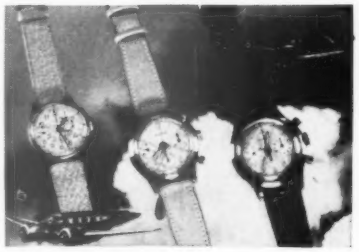

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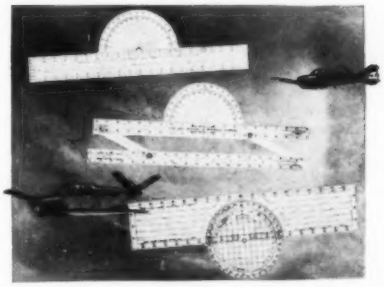

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